ORDER NO.: G25
CONTRACT ID. NO.: C00061322C02

ATTACHMENT 2 [Dewatering Memorandum]

Revised Final

Technical Memorandum

Dewatering Requirements For the I-564 Intermodal Connector Project In The Camp Allen Area

Naval Station Norfolk

Norfolk, Virginia

Prepared for

Department of the Navy
Atlantic Division
Naval Facilities Engineering Command
Norfolk, Virginia

Under Contract No. N62470-95-D-6007
CONTRACT TASK ORDER 0171

Prepared by

CH2MHILL

Virginia Beach, Virginia

June 2005

Memor

ORDER NO.: G25
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REVISED FINAL

Technical Memorandum
Dewatering Requirements for the I-564 Intermodal Connector Project in the Camp Allen Area

NAVAL STATION NORFOLK
NORFOLK, VIRGINIA

CONTRACT TASK ORDER 0117

Prepared For:

DEPARTMENT OF THE NAVY
ATLANTIC DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
Norfolk, Virginia

Under the:

LANTDIV CLEAN Program
Contract N62470-95-D-6007

Prepared By:

CH2MHILL

Baker Environmental, Inc.

June 2005

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Acronyms and Abbreviations

bgs	below ground surface
BTX	Benzene-Toluene-Xylene
CAL	Camp Allen Landfill
CASY	Camp Allen Salvage Yard
CATP	Camp Allen Treatment Plant
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COPC	Contaminants of Potential Concern
DPVE	Dual Phase Vapor Extraction
FFA	Federal Facilities Agreement
gpm	gallons per minute
HHRA	Human Health Risk Assessment
MCL	Maximum Contaminant Level
NPL	National Priorities List
OSHA	Occupational, Safety, and Health Administration
PAH	Polynuclear Aromatic Hydrocarbons
PCB	Polychlorinated Biphenyl
RCRA	Resource, Conservation, and Recovery Act
RI	Remedial Investigation
SARA	Superfund Amendments and Reauthorization Act
SVOC	Semivolatile Organic Compound
TEGD	Technical Enforcement Guidance
TCLP	Toxicity Characteristic Leachate Procedure
USEPA	United States Environmental Protection Agency
VDEQ	Virginia Department of Environmental Quality
VDOT	Virginia Department of Transportation
VOC	Volatile Organic Compound

1 Introduction

The following document outlines the technical requirements for the Virginia Department of Transportation (VDOT) and associated subcontractors to conduct dewatering operations in the Camp Allen area of Naval Station Norfolk, Norfolk, Virginia, pursuant to VDOT's plan to construct the I-564 Intermodal Connector in an area just to the north of the CAL (see Figure 1). VDOT's planned dewatering from construction activities could potentially impact the groundwater plume for the CAL. However, the dewatering is not anticipated to reduce the overall effectiveness of hydraulic containment of the plume. The Camp Allen Treatment Plant (CATP) will be used to treat groundwater encountered during VDOT's on-site dewatering activities for utilities and roadway construction.

Under NAVSTA Norfolk's, Installation Restoration Program, the Camp Allen Treatment Plant (CATP) is a groundwater remediation system constructed as part of the final selected groundwater remedy at the CAL, which collects, treats, and discharges groundwater to a drainage ditch flowing to nearby Bousch Creek. The expanded use of the CATP from these activities will require modifications to the plant to address sediment loading and increased monitoring and modeling to assure continued capture of the Camp Allen Area (CAA) groundwater plume. The areas currently proposed by VDOT for dewatering include (1) Installation of communication equipment near manhole CA-58, (2) Utility installation associated with the relocation of Fleetrec Park, and (3) Fleetrec Park Construction. It is anticipated that additional dewatering will be required within the Camp Allen area.

VDOT is requesting the use of the CATP to treat groundwater drawn from the shallow aquifer for dewatering processes associated with the I-564 Intermodal Connector Project. Due to the potential infringement on institutional controls and the use of groundwater from the aquifer under the CAA, construction workers may have an increased risk of exposure to contaminated soils and groundwater. In addition, dewatering activities may breach current institutional controls for containing contaminated soils and groundwater, and could cause an increased potential for the migration of the contaminated groundwater plume beyond the Navy's property boundaries. VDOT has assumed responsibility for these eventualities and will be financially responsible for them and for any modifications to the CATP.

This goal of this document is to provide the technical requirements to VDOT and its subcontractors on the use of the CATP for dewatering operations in the Camp Allen area associated with the I-564 Intermodal Connector Project. This document shall:

- Provide a description of the Camp Allen Landfill and Camp Allen Salvage Yard and their historic uses.
- Identify the technical requirements for the dewatering operations including interface details, pretreatment requirements, environmental controls and CATP service limitations.
- Provide Navy point of contact information.

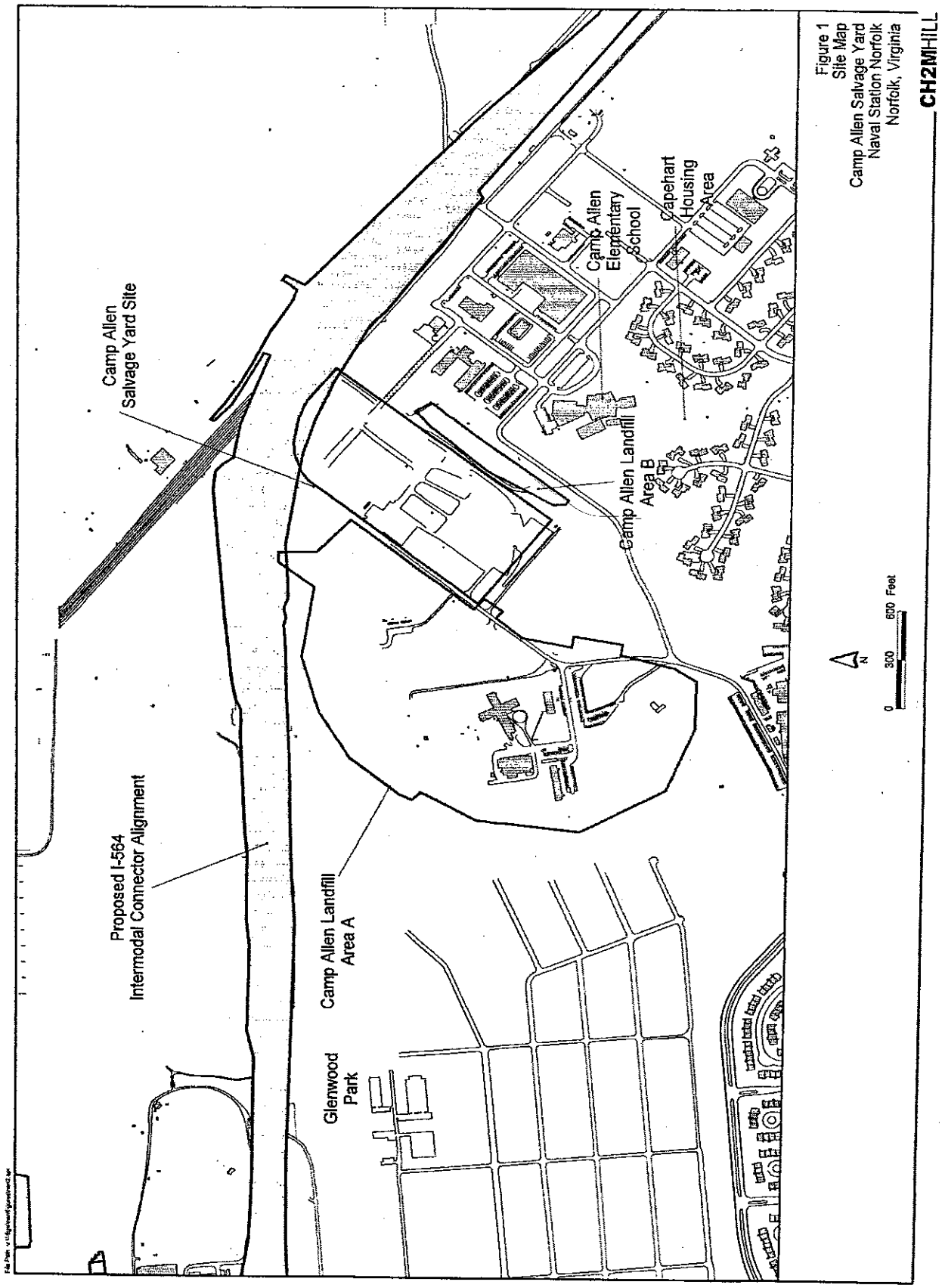

Figure 1
Site Map
Camp Allen Salvage Yard
Naval Station Norfolk
Norfolk, Virginia
CH2MHILL

2 Site Description

The areas known as Camp Allen Landfill (CAL) and Camp Allen Salvage Yard (CASY) are located within the property boundary of the Naval Station Norfolk. They are located south of the Naval Station airfield and Interstate 564 in the area known as Camp Allen. CASY lies between Areas A and B of the CAL. Ingersol Street divides the sites. Figure 1 shows the CAL, CASY and surrounding areas. At present, the majority of the CAL is covered with soil and grass to minimize surface erosion. Area A incorporates the Navy Brig facility and a heliport built over a portion of the landfill during the mid-1970s. A residential area, Glenwood Park, is located to the west of the site, off of government property. At present the CASY is undergoing remediation and will be covered a one-foot vegetated soil cover.

As a result of past Navy operations, groundwater (both the shallow, Columbia aquifer, and the deep Yorktown aquifer) under the CAA is currently contaminated. The shallow aquifer groundwater may be encountered at a depth of three to eight feet below ground surface. The deep aquifer groundwater may be encountered at a depth of 23 to 50 feet below ground surface. Cleanup goals and the selected remedy were developed to address the contaminants of concern (COC) in both the Yorktown (deep) and the Columbia (shallow) groundwater aquifers at the CAL. COCs included the following volatile organic chemicals (VOCs) for both media of concern: 1,2-dicholoroethane, 1,2-dichloroethene (cis), 1,1,1-trichloroethane, benzene, ethylbenzene, tetrachloroethene, toluene, trichloroethene, vinyl chloride, and xylenes. Separate cleanup goals were established for both the deep and shallow groundwater. Total inorganic constituents detected in both aquifers in concentrations exceeding drinking water standards are believed to be associated with total suspended solids present in the wells and not representative of actual groundwater contamination. A detailed description of the environmental conditions for the CALF and the CASY are included in the documents referenced at the end of this document. Soil and groundwater sampling locations for which there is analytical data available are shown on Figure 2.

In 1997, the Navy started the operation of the Camp Allen Treatment Plant (CATP), a groundwater remediation system that collects, treats, and discharges groundwater to the drainage ditch that flows to Bousch Creek. The purpose of the CATP is to both contain the contaminated groundwater plume on government property, as well as to treat the contaminated groundwater to levels that meet Federal and/or State groundwater or surface water standards prior to discharge. Fifteen groundwater extraction wells collect groundwater in the vicinity of the CAA for treatment at CATP. Due to the elevated levels of naturally occurring metals with the groundwater, the CATP requires the removal of metals from the groundwater prior to discharge. The CATP is designed for an average flow of 150 gallons per minute (gpm), with design flows from Area A of 3 gpm for each of the two shallow wells, and 35 gpm for each of the three deep wells. The design flows for Area B of 3 gpm for each of the seven shallow wells, and 3 gpm for each of the four deep wells. Locations of the capture zones of the groundwater extraction wells for the shallow and deep wells are shown as Figures 3 and 4, respectively. In addition to the CATP, the CAL also has a Dual Phase Vapor Extraction (DPVE) system that is designed to address the localized VOC

contamination in the soil and groundwater, which is designed to operate at 30 gpm from extractions wells that are 25' deep.

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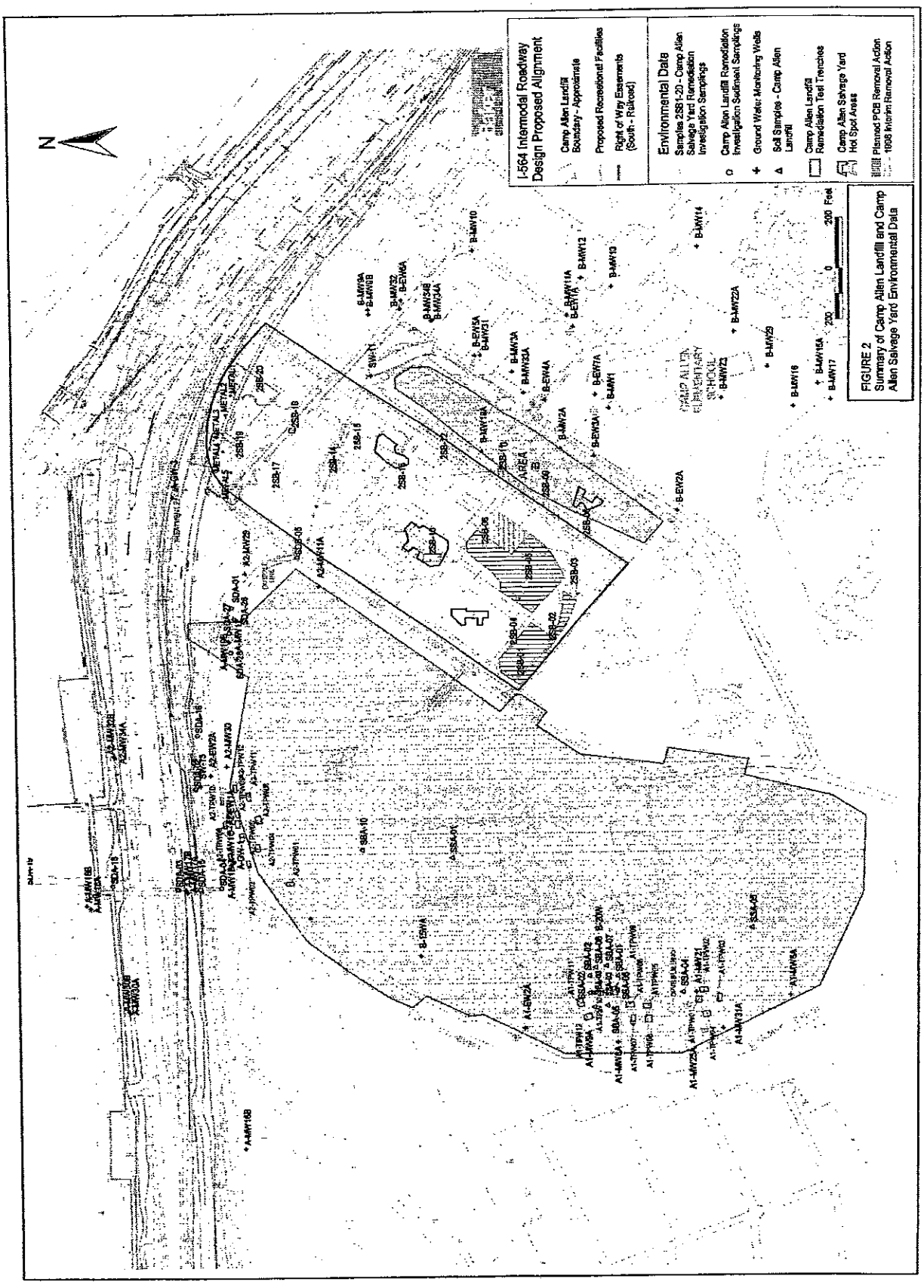

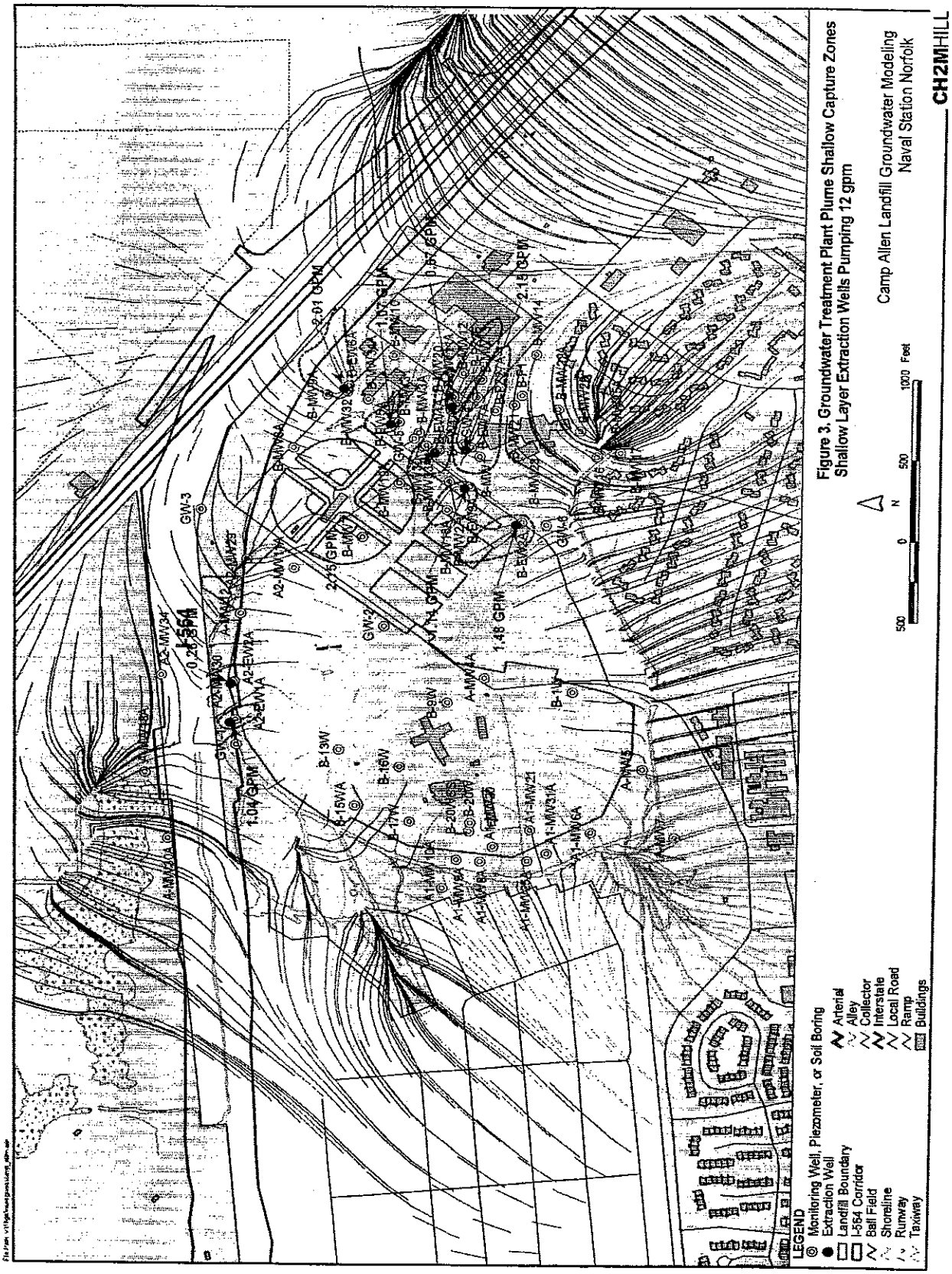

Figure 3. Groundwater Treatment Plant Plume Shallow Capture Zones
Shallow Layer Extraction Wells Pumping 12 gpm

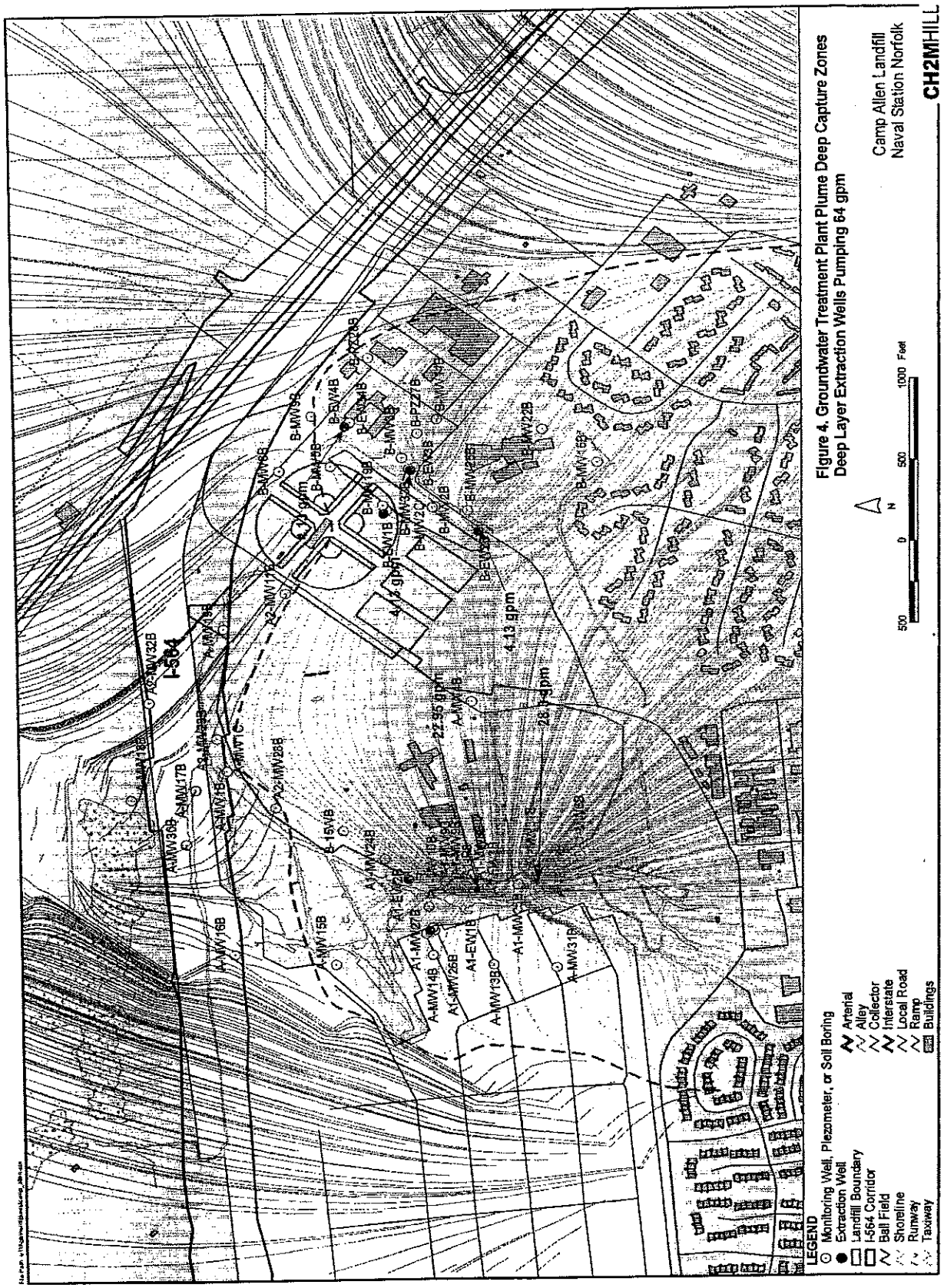

Figure 4. Groundwater Treatment Plant Plume Deep Capture Zones
Deep Layer Extraction Wells Pumping 64 gpm

3 Technical Requirements

3.1 Work Plans

Based on the nature and extent of contamination at the CAA, and because this area is being managed by the Navy as part of the IR Program for the Naval Station, subject to the requirements of a FFA, the Navy will require VDOT to provide detailed performance specifications or work plans describing the approach and methodology for managing contaminated groundwater during dewatering operations at the CAA. These plans shall be prepared in advance and incorporated into standard procedures related to dewatering, and all other practices not specifically outlined in this document. The work plan requirements are identified in Section 8.0 of the Technical Memorandum, Construction Restrictions For Navy Property and shall include at a minimum the following:

- **Health and Safety Plan**: VDOT shall develop a Health and Safety Plan in advance of any field activities that will be submitted to the Navy for review. The plan should describe safety precautions for each phase of the project as specifically related to dewatering. The plan should additionally identify safety equipment and procedures to be available and used during the project. It should also furnish the name and qualifications based on education, training, and work experience of the proposed field staff. Any dewatering operations shall be supervised by a person 29 CFR 1910.120 HAZWOPER certified as a site manager All site workers that come in contact with the groundwater shal l be 29 CFR 1910.120 HAZWOPER certified as a site worker.

- **Material Handling Plan**: A material handling plan should be prepared prior to initiation of the work that includes a detailed explanation of the phases dealing with all groundwater dewatering operations including the following: a schedule to be employed for the dewatering activities, a sequence of operation, the method of dewatering, proposed pre-treatment equipment to remove suspended sediments, and handling of the accumulated contaminated solids, testing requirements, and safety precautions and requirements. The plan should also show locations of proposed temporary storage structures and address the potential for permitting requirements.

- **Field Sampling and Laboratory Testing Plan for Soils and Groundwater**: The plan should describe field sampling methods and quality control procedures. Confirmatory sampling and testing of groundwater used to assess plume migration shall be performed by a qualified laboratory and should be explained in detail. The maximum analytical detection limits shall not exceed 1.0 ug/L for each of the site-specific contaminants summarized in Table 1.

TABLE 1
Summary of the Camp Allen Site Specific Contaminants

1,2-Dichloroethane
cis-1,2-Dichloroethene
1,1,1-Trichloroethane
Benzene
Ethylbenzene
Tetrachloroethene
Toluene
Trichloroethene
Vinyl Chloride
Xylenes

3.1.1 Groundwater Treatment

The following summarizes the groundwater treatment requirements for VDOT to utilize the Camp Allen Treatment Plant (CATP) to process and treat the groundwater from agreed upon dewatering activities for the I-564 Connector.

- Contaminated groundwater can be accepted into the CATP from only those areas inside the one-microgram per liter (ug/L) shallow VOC plume associated with the CAA areas shown on Figure 5. The dewatering operations currently identified by VDOT, in order of occurrence and length of duration, shall include:
    - Communication equipment installation near manhole CA-58 - shall not exceed a withdrawal rate of 50 gpm for no longer than six weeks.
    - Fleetrec Park Utility Installation – shall not exceed a withdrawal rate of 50 gpm for no longer than 5 months.
    - Fleetrec Park Construction – shall not exceed a withdrawal rate of 50 gpm for no longer than 6 months.
- VDOT shall submit any additional dewatering operations requiring use of the CATP to the Navy for review and approval.
- The maximum flow rate from dewatering operations shall be limited to the CATP's additional capacity of 50 gpm. It is the Navy's intention to provide treatment capability for 24 hrs/day and 7 days/week. However, should the CATP experience an outage, the Navy cannot guarantee that treatment operations will be restored within a 90-day period. In the event of an outage, VDOT must manage accumulated groundwater under Virginia Solid Waste Regulations. The Decision Document for the Camp Allen Landfill site does not specify an acceptable maximum outage. Therefore, VDOT shall be prepared to cease dewatering or address an outage via other disposal alternatives and have appropriate storage available when the Navy has an outage associated with routine

maintenance. The Navy has experienced a 98% reliability rate for the plant. Typical plant outage time associated with scheduled maintenance and power outages is outlined Appendix A.

- The groundwater from the dewatering operations shall be discharged to a water pretreatment facility that shall be constructed and operated by VDOT and located 150 feet or less to the northwest of the CATP as shown on Figure 6.
- VDOT shall install a flow meter, capable of monitoring for total flow and instantaneous flow, between the dewatering discharge pipe and the first pretreatment tank and shall monitor flow on a continuous basis. Flow rate from VDOT's dewatering shall be limited to less than 50 gpm.
- The water pretreatment facility shall be operated during all dewatering operations for the removal of suspended sediments from the extracted groundwater prior to discharge into the CATP. The facility will include settling tanks and filtration equipment, such as bagfilters, to remove the suspended sediments from the groundwater. In addition, the facility will include an equalization tank, with a minimum capacity of 5,000 gallons that will store the filtered water. The suspended sediments of the pre-treated groundwater shall not exceed 10.0 mg/L prior to discharge into the CATP.
- VDOT shall monitor the water in the equalization tank on a daily basis for suspended solids. The analysis will be done in the field within a four-hour period in accordance with an approved ASTM or EPA Method. Analytical results will be submitted to the Navy within 24 hours of sample collection.
- Navy shall install a flow control station at the VDOT discharge into the pretreatment facility to limit the flow to the 50-gpm limit. This flow control station will consist of a 1-1/2-inch magnetic flow meter, a pinch control valve, either a local flow controller or a PLC/SCADA configured flow controller, manual isolation ball valves for the flow control station, and a manual ball valve for a flow control station bypass line.
- Utilizing a submersible effluent style pump, the Navy shall pump the pretreated water from VDOT's equalization tank into the CATP.
- The water transmission system from the pretreatment system to CATP, to be installed by the Navy, shall include a pressure switch, to open a recirculation line back to the dewatering settling tank when there is a plant outage which will close the VDOT feed line (pretreatment discharge line) to the CATP.
- Treatment of the groundwater shall be completed in accordance with the Non-Significant Differences Documentation to the existing CERCLA, July 17, 1995 Decision Document for Camp Allen Landfill (CALF). The Non-Significant Differences Documentation addresses the groundwater within the CALF Shallow Volatile Organic Compound (VOC) plume (See Figures 5.).
- All non-disposable groundwater treatment and sampling equipment that comes in contact with contaminated groundwater shall be decontaminated immediately after use and prior to being removed from the site. The procedures for the decontamination of personnel and equipment shall be included in the Work Plan.

- Installation of groundwater treatment controls, monitoring, equipment, pretreatment equipment, metering, and site cleanup costs will be VDOT's responsibility.
- VDOT shall address the impacts from storm water runoff during construction activities. Contractors will be required to implement storm water management practices to minimize the impact of storm water on the CAA.

3.1.2 Sediment Handling

The accumulated sediments within the pretreatment facility, resulting from the dewatering operations, shall be safely managed and properly disposed of. It is VDOT's responsibility to determine the type and frequency of sampling required to be protective of human health and to determine proper disposal methods. All sampling and disposal activities must be in accordance with the appropriate regulatory requirements and the Navy's requirements. Samples of the accumulated solids are to be collected and analyzed for the methods outlined in Table 2. All activities are additionally subject to approval by the Navy, Virginia DEQ, and EPA via the review of site-specific work plans.

TABLE 2
Soil Disposal Testing Methods

Analyte(s)	Analytical Method
TCLP	1311/8260B,8270C,8081A,8151A,6010B/7470A
Ignitability	1010, Modified 1010
Reactive Cyanide/Sulfide	SW-846 Section 7
Corrosivity	9040, 9045

3.1.3 Spill Prevention

VDOT shall provide spill control measures, including secondary containment and automatic high water level shutoff controls within the pretreatment tanks, to demonstrate that there will be no surface discharges of water from either the tank or distribution lines during the dewatering operations and CATP outages. The specific spill prevention measures shall be provided by VDOT in the work plans prior to initiating dewatering operations.

3.1.4 Groundwater Modeling

VDOT shall utilize a MODFLOW groundwater flow model to assess the impact of all dewatering operations on the existing CALF groundwater and Navy remediation system to ensure that existing capture zones (Figures 3 and 4) and VOC plume (Figures 5) are not adversely altered by construction dewatering. The data that the Navy believes is relevant to the modeling was provided to VDOT's contractor, Marshall Miller and Associates. The Navy will review VDOT's modeling results within three weeks of receipt from VDOT and advise of any dewatering scenarios considered unacceptable. Specifically, the modeling shall demonstrate the following acceptable conditions:

- Where the groundwater withdrawal locations are outside the shallow VOC Plume boundary (Figure 5), the capture zone of the shallow dewatering wells shall not extend across the plume boundary to expand the plume.
- Where the groundwater withdrawal location are within the shallow VOC Plume boundary (Figure 5), the capture zone of the shallow dewatering wells shall be located such that the groundwater flow direction within the capture zone is towards the center of the plume.

3.1.5 Groundwater Monitoring

To verify the modeling results of the dewatering operations the following groundwater monitoring is to be conducted:

- Where the groundwater dewatering locations are outside the shallow VOC Plume boundary groundwater samples shall be collected from a location between the dewatering wells and the plume boundary. Samples shall be collected before, during and after the dewatering operation and analyzed for VOCs using EPA CLP Method OLCO2. Groundwater samples are to be collected every two weeks during dewatering operations and analyzed within 48 hours of sample collection. The analytical results are to be reported to the Navy within four days of sample collection. The samples shall be collected from either existing monitoring wells or new monitoring wells (to be installed by VDOT) that are located within the shallow aquifer.
- Prior to and during dewatering operations, groundwater level measurements shall be collected by VDOT at least twice per day from at least two wells located within a 100-foot radius of the dewatering wells. The water levels shall be collected from either existing monitoring wells or new monitoring wells (to be installed by VDOT) that are located within the shallow aquifer.
- If the groundwater monitoring outside the plume demonstrates that the groundwater plume has expanded, by an increase in the VOC concentrations, VDOT shall cease the dewatering operation.

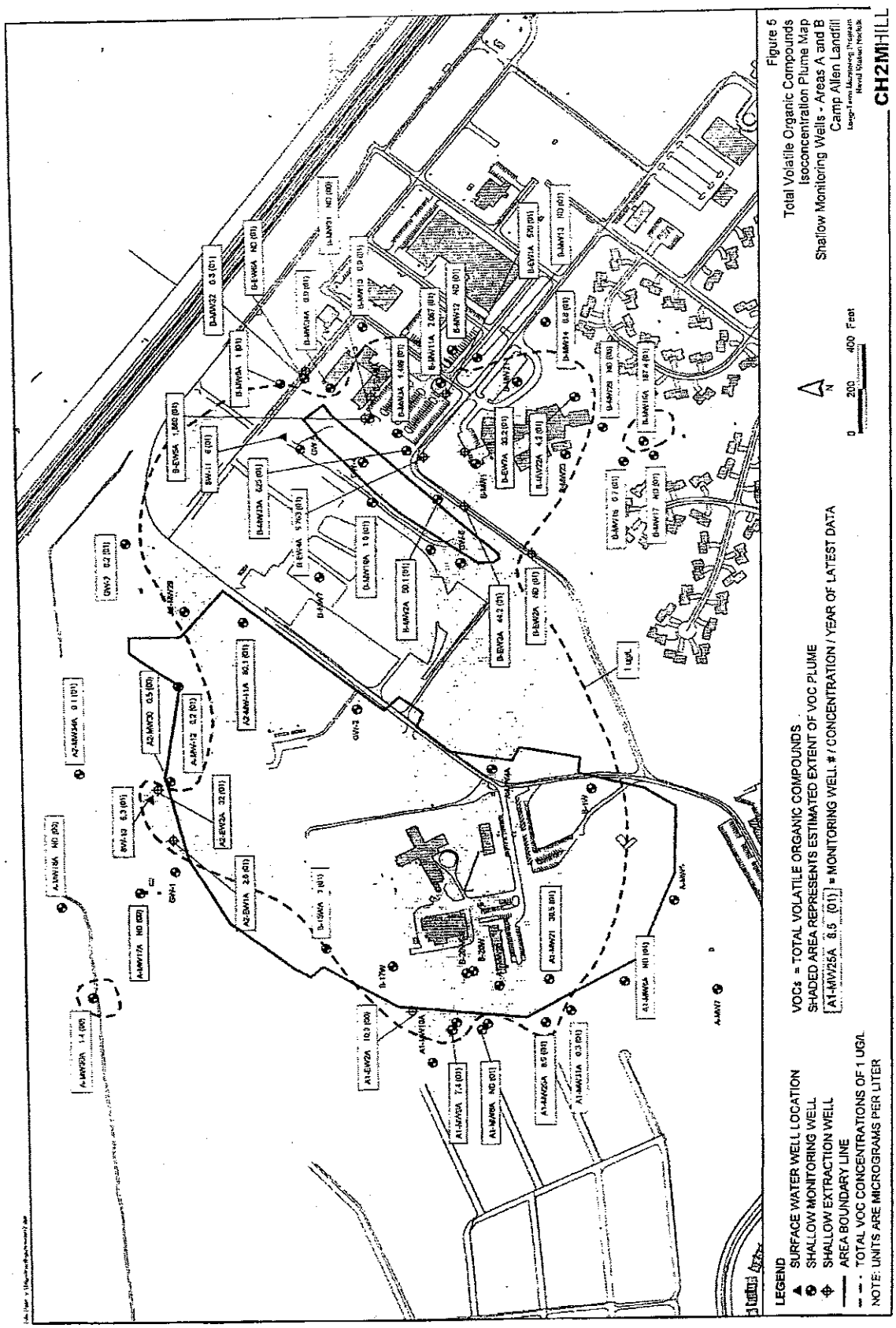
Figure 5
Total Volatile Organic Compounds
Isoconcentration Plume Map
Shallow Monitoring Wells - Areas A and B
Camp Allen Landfill
Long-Term Monitoring Program
Naval Station Norfolk
CH2MHILL
LEGEND
SURFACE WATER WELL LOCATION
SHALLOW MONITORING WELL
SHALLOW EXTRACTION WELL
AREA BOUNDARY LINE
- - - TOTAL VOC CONCENTRATIONS OF 1 UG/L
NOTE: UNITS ARE MICROGRAMS PER LITER
VOCs = TOTAL VOLATILE ORGANIC COMPOUNDS
SHADED AREA REPRESENTS ESTIMATED EXTENT OF VOC PLUME
A1-MW25A 8.5 (01) = MONITORING WELL # / CONCENTRATION / YEAR OF LATEST DATA
N
0 200 400 Feet

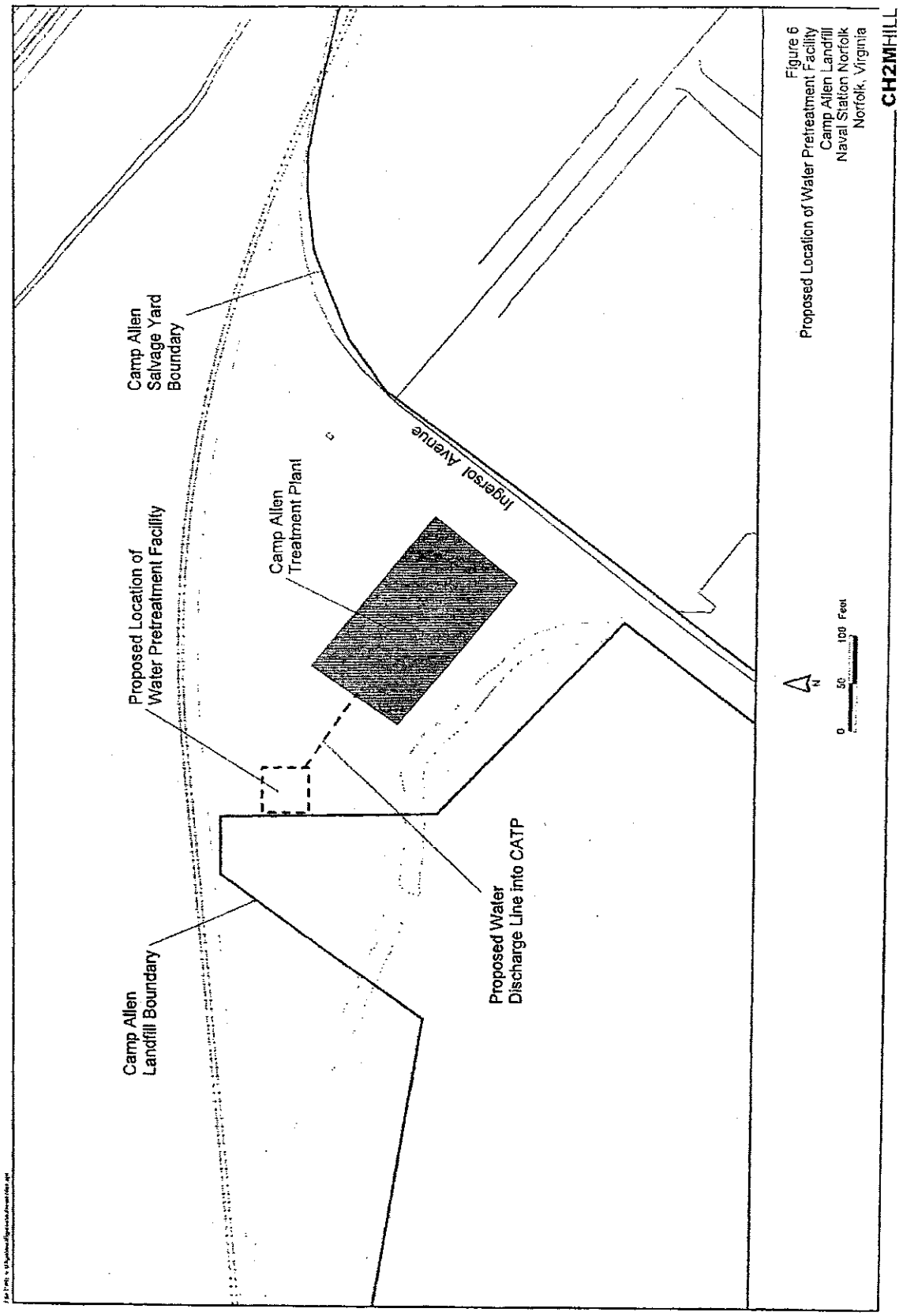

Figure 6
Proposed Location of Water Pretreatment Facility
Camp Allen Landfill
Naval Station Norfolk
Norfolk, Virginia
CH2MHILL

4 Navy Points of Contact

All work plans and groundwater modeling reports will be submitted to the Navy for review and approval prior to conducting any dewatering operations in the field. The documents are to be submitted to the Navy Site Manager. All field operations of the dewatering are to be coordinated with the Camp Allen Treatment Plant Operator.

5 References

Baker Environmental, Inc. (Baker). 1994. Final Camp Allen Landfill RI Report, Norfolk Naval Base, Norfolk, VA. Contract Task Order 0084, Contract N62470-89-D-4814.

Baker Environmental, Inc. (Baker). 1995a. Revised Final Baseline Risk Assessment, Camp Allen Landfill, Norfolk Naval Base, Norfolk, VA. Contract Task Order 0084, Contract N62470-89-D-4814.

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Baker Environmental, Inc. (Baker). 1998. Final Engineering Evaluation/ Cost Analysis (EE/CA), Camp Allen Salvage Yard, Norfolk Naval Base. Contract Task Order 0353, Contract N62470-89-D-4814.

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Baker Environmental, Inc. (Baker). 2002a. Non-Significant Differences Documentation, Camp Allen Landfill Site 1, Naval Station Norfolk, Norfolk, VA. Contract Task Order 0353, Contract N62470-89-D-4814.

CH2MHILL, Inc. 2002a. 2001 Annual Long Term monitoring Report, Naval Station Norfolk, Norfolk, Virginia, Contract Task Order 0156, Contract N62470-95-D-6007.

CH2MHILL, Inc. 2002b. Technical Memorandum Construction Restrictions for Navy Property, Naval Station Norfolk, Norfolk, VA. Contract Task Order 0117, Contract N62470-95-D-6007.

APPENDIX A

Camp Allen Treatment Plant Shut Down

Annual O&M requires the following shutdown time:

Process tank cleaning/inspection - 1 day for each of 3 tanks (3 total days)

Clarifier inspection/cleaning - 2 days 2x annually (4 total days)

Pipe/valve inspection/cleaning (between T-130 & clarifier) 2 days 2x annually(4 total days)

Carbon and sand cell changeout - 3 days total (unless done prior to VDOT water intro.)

Emergency shut downs:

The CATP averages 98 percent operational time for the plant which equates to about 1 week of unanticipated down time per year. Most of that down time is attributed to plant power supply interruptions that cause the plant to go down during unattended hours. As an example, a power interruption recently occurred during the night and the plant was re-started in the morning.

On an annual basis the CATP would typically experience three instances of unanticipated shutdown for two days each.

ATTACHMENT 3 to Special Provision for Management of Contaminated Groundwater, Relocated Fleetrec Park

NAVY EXAMPLE HEALTH AND SAFETY PLAN

Introduction

The health and safety of site personnel and the public are a primary concern during investigative and remedial activities at potentially hazardous sites. This Master Health and Safety Plan (HASP) presents the conditions and hazards known or anticipated to be present at the RI/FS and SSA sites at Naval Base, Norfolk (NBN). This Master HASP will be used by xxxxxx to identify and mitigate potential site and task-specific hazards and to select appropriate health and safety protective measures to be used during future tasks and operations on Base.

This Master HASP has been developed based on available information pertaining to NBN and contains information pertinent to the general conditions on the Base such as general site information, hazard evaluation and control, personnel responsibilities and requirements, a general description of personal protective equipment, customary decontamination procedures, and emergency response procedures. A site-specific HASP will be written each time task orders and field activities are initiated at an area of investigation. The site-specific HASP will address specific sites and incorporate new information in the areas of site tasks, environmental hazards, site control procedures, personal protective equipment (PPE), and environmental monitoring. ***Information to be included in the site-specific HASP is outlined in the HASP site-specific checklist, located in Attachment A of the Master WP.*** As field programs proceed, this Master HASP will be periodically evaluated (every one year at a minimum) against current information and Base concerns. As significant changes are presented, this Master HASP will be updated.

Policy

It is the policy of xxxxx that on-site hazardous waste management activities be performed in conformance with both the Master HASP and a site-specific HASP. Both documents are written based on the anticipated hazards and expected work conditions and apply to field activities to be performed under this Contract. Applicability of this Master HASP and the site-specific HASP extends to xxxxx, and visitors entering the site. xxxxx must follow an established health and safety plan; in most cases either adopting this master plan with appropriate site-specific HASP (e.g. surveyor), or adopting same and amending both with safety and/or health requirements specific to their work (e.g. driller). Subcontractor-authored HASPs must be reviewed by the Project Health and Safety Officer (PHSO) before commencing on-site work. This information will then become part of the site-specific HASP. On-site personnel must review the Master HASP and the site-specific HASP and sign an agreement to comply with its provisions prior to commencing on-site work. The Master HASP and site-specific HASP are considered operational documents which are subject to revisions in response to various site-specific conditions which may be encountered. However, they may be modified/updated only with the approval of the PHSO and Project Manager.

This Master HASP, in combination with each site-specific HASP will, at a minimum, meet the requirements under OSHA Standard 29 Code of Federal Regulations (CFR) 1910.120 (Hazardous Waste Operations and Emergency Response).

[redacted]

Pre-Entry Requirements

During site mobilization, the Site Health and Safety Officer (SHSO) will perform a reconnaissance of each site as identified in the site-specific Work Plan (WP) to evaluate and determine the chemical, physical, and environmental hazards; establish or confirm emergency points of contact and procedures; and review any other issues deemed necessary to address site safety and health. The SHSO will then conduct a health and safety briefing with the site personnel to discuss data obtained from the previous site reconnaissance, provisions outlined in this Master HASP and site-specific HASP, and appropriate safety and health related procedures and protocols.

[redacted]

XXXXX MASTER HEALTH AND SAFETY PLAN
(Reference XXXXX SOP 19, *Health and Safety Plans*)

This HASP will be kept on the site with the site-specific addendum during field activities and will be reviewed and updated as necessary. The site safety coordinator (SSC) is to be familiar with the content of the HASP and the site-specific addendum. Site personnel must sign Attachment 1.

1 PROJECT INFORMATION AND DESCRIPTION

REFER TO THE SITE-SPECIFIC HASP FOR ADDITIONAL INFORMATION

CLIENT OR OWNER: Department of the Navy, Atlantic Division — **PROJECT NO:**

XXXXX PROJECT MANAGER: — **OFFICE:** WDC

SITE NAME: Naval Base, Norfolk

SITE ADDRESS: 1510 Gilbert Street
Norfolk, Virginia 23511-2699

DATE HEALTH AND SAFETY PLAN PREPARED: June 20, 1996

DATE(S) OF SITE WORK: June 1996 through June 1997

SITE ACCESS: All sites at the NBN are accessed through the Main Gate of the Base.

SITE SIZE: NBN is located on 4,631 acres of land directly northwest of the city of Norfolk, Virginia.

SITE TOPOGRAPHY: The facility is bounded on the north by Willoughby Bay, on the west by the junction of the Elizabeth River and the James River (forming the Hampton Roads), and on the south and east by the city of Norfolk. A portion of the east boundary of the facility is formed by Mason Creek (Figure 1-1). The Base includes approximately 4000 buildings and an airfield. The western portion of the Base is a developed waterfront area that contains piers and facilities for loading, unloading, and servicing naval vessels.

Land use surrounding Base is industrial and residential. The waterfront area south of the site provides shipping facilities for several large industries. Residential land use is located to the south and east of the Base. Willoughby Spit, a low-density residential area located northeast of Base, is also used for recreational activities.

PREVAILING WEATHER: The Norfolk region has a maritime climate which is characterized by long temperate summers and mild winters. The average annual temperature is 60.7 degrees Fahrenheit (F). July is the warmest month, with temperatures averaging 78.7 degrees F; while January is the coolest month, with temperatures averaging 43.1 degrees F. Freezing temperatures are infrequent in the region. Precipitation averages 43 inches annually and is evenly distributed throughout the year. A slight increase in precipitation occurs from June to August due to the prevalence of convective thunderstorms. The average annual snowfall is 8.8 inches. Winds are generally in the easterly direction and moderate, ranging from six to eleven knots.

SITE DESCRIPTION AND HISTORY: NBN, began operations in 1917 when the US Navy acquired 474 acres of land to develop a naval base to support World War I activities. Bulkheads

[redacted]

were built along the coast to extend available land. After dredge and fill operations, the total land under Navy control was 792 acres.

An additional 143 acres of land were acquired in 1918 and officially commissioned for the Naval Air Station (NAS). From 1936 until 1940, improvements to the piers and expansion of supplies/ materials handling facilities were completed.

During World War II (between 1940 and 1945) major construction projects were completed including a hospital, power plant, numerous runways and hangers, a tank farm, and several barracks/housing complexes. During this time the area of the Base expanded to over 2,100 acres due to U.S. involvement in World War II. After World War II, the Base continued to acquire land through various types of land transfers and dredge and fill operations conducted in areas of Mason Creek and Bousch Creek Basins and Willoughby Bay. During its history the Base has expanded to become the worlds largest naval installation. In 1995, the Base had 15 piers handling 3,100 ship movements annually.

[redacted]

THIS PAGE IS RESERVED FOR SITE MAP.

NOTE LOCATIONS OF SUPPORT, DECONTAMINATION, AND EXCLUSION ZONES; SITE TELEPHONE; FIRST AID STATION; EVACUATION ROUTES AND ASSEMBLY AREAS.

Nearest public hospital:

DePaul Medical Center
150 Kingsley Lane, Norfolk, Virginia
On-base phone: (9) 889-5111 (Emergency Room)
Off-base phone: (757) 889-5111 (Emergency Room)

Local ambulance service:

Servell Point Clinic
Intersection of Admiral Training and Hampton Boulevard
Bldg. No. CD2
On-base phone: (4) 2674
Off-base phone: (757) 444-2674

[redacted]

2 PROJECT ORGANIZATION AND TASKS TO BE PERFORMED UNDER THIS PLAN

2.1 PROJECT ORGANIZATION

REFER TO SITE-SPECIFIC HASP FOR ADDITIONAL INFORMATION

CLIENT: Department of the Navy
Atlantic Division
Naval Facilities Engineering Command

XXXXX: Project Manager:
Field Team Leader:
Field Staff:

CONTRACTORS and SUBCONTRACTORS: To be included in site-specific addendum to this master HASP.

2.2 DESCRIPTION OF TASKS (Reference Section 1, "Field Activity Start-up Form," of *Site Safety Notebook*

Refer to site-specific addenda (i.e., work plan, field sampling plan) for detailed task information. A health and safety risk analysis has been performed for each task and is incorporated in the site-specific addendum to this plan through task-specific hazard controls and requirements for monitoring and protection. Tasks in addition to those listed below and in the site-specific addendum require an approved amendment before additional work begins. Refer to Section 10.2 for procedures related to tasks that do not involve hazardous waste operations and emergency response (Hazwoper).

2.2.1 HAZWOPER-REGULATED TASKS

- Test pit and excavation
- Soil boring installation
- Geoprobe boring
- Geophysical surveys
- Hand augering
- Subsurface soil sampling
- Surface soil sampling
- Soil gas surveys
- Sediment sampling
- Monitoring well/drive point installation
- Monitoring well abandonment
- Groundwater sampling
- Aquifer testing
- Hydrologic measurements
- Surface water sampling
- Biota sampling
- Investigation-derived waste (drum) sampling and disposal
- Observation of loading of material for offsite disposal
- Oversight of remediation and construction

2.2.2 NON-HAZWOPER-REGULATED TASKS

Under specific circumstances, the training and medical monitoring requirements of federal or state Hazwoper regulations are not applicable. It must be demonstrated that the tasks can be performed without the possibility of exposure in order to use non-Hazwoper-trained personnel. **Prior approval from the HSM is required before these tasks are conducted on regulated hazardous waste sites.**

TASK	RESTRICTIVE CONDITIONS
• Electrical installation	THESE TASKS ARE NOT CURRENTLY PLANNED, AND MUST BE ADDRESSED IN THE SITE-SPECIFIC HASP.
• Iron work (installing rebar)	
• Masonry work	
• General heavy equipment work (excavation, grading, etc.)	
• Mechanical installations (equipment, pumps, etc.)	
• Engineering testing/evaluation	
• Building construction	

[redacted]

3 HAZARD EVALUATION AND CONTROL

This section discusses the evaluation and control of some hazards typically associated with NBN. Each new task or area of investigation may introduce other hazards not listed in this HASP.

REFER TO THE SITE-SPECIFIC HASP FOR INFORMATION ON OTHER POTENTIAL HAZARDS

3.1 HEAT AND COLD STRESS (Reference XXXXX SOP HS-09, *Heat and Cold Stress*)

3.1.1 PREVENTING HEAT STRESS

- Drink 16 ounces of water before beginning work, such as in the morning or after lunch. Disposable (e.g., 4-ounce) cups and water maintained at 50° to 60°F should be available. Under severe conditions, drink 1 to 2 cups every 20 minutes, for a total of 1 to 2 gallons per day. Take regular breaks in a cool, preferably air-conditioned, area. Do not use alcohol in place of water or other nonalcoholic fluids. Decrease your intake of coffee and caffeinated soft drinks during working hours. Monitor for signs of heat stress.
- Acclimate to site work conditions by slowly increasing workloads; e.g., do not begin site work with extremely demanding activities.
- Use cooling devices, such as cooling vests, to aid natural body ventilation. The devices add weight, so their use should be balanced against efficiency.
- Use mobile showers or hose-down facilities to reduce body temperature and cool protective clothing.
- During hot weather, conduct field activities in the early morning or evening if possible.
- Provide adequate shelter to protect personnel against radiant heat (sun, flames, hot metal), which can decrease physical efficiency and increase the probability of heat stress.
- In hot weather, rotate shifts of workers.
- Maintain good hygiene standards by frequently changing clothing and by showering. Clothing should be permitted to dry during rest periods. Persons who notice skin problems should consult medical personnel.

3.1.2 SYMPTOMS AND TREATMENT OF HEAT STRESS

	Heat Syncope	Heat Rash (*miliaria rubra*, "prickly heat")	Heat Cramps	Heat Exhaustion	Heat Stroke
Signs and Symptoms	Sluggishness or fainting while standing erect or immobile in heat.	Profuse tiny raised red blister-like vesicles on affected areas, along with prickling sensations during heat exposure.	Painful spasms in muscles used during work (arms, legs, or abdomen); onset during or after work hours.	Fatigue, nausea, headache, giddiness; skin clammy and moist; complexion pale, muddy, or flushed; may faint on standing; rapid thready pulse and low blood pressure; oral temperature normal or low	Red, hot, dry skin; dizziness; confusion; rapid breathing and pulse; high oral temperature.

3.1.2 SYMPTOMS AND TREATMENT OF HEAT STRESS

Treatment	Remove to cooler area. Rest lying down. Increase fluid intake. Recovery usually is prompt and complete.	Use mild drying lotions and powders, and keep skin clean for drying skin and preventing infection.	Remove to cooler area. Rest lying down. Increase fluid intake.	Remove to cooler area. Rest lying down, with head in low position. Administer fluids by mouth. Seek medical attention.	Cool rapidly by soaking in cool- but not cold- water. Call ambulance, and get medical attention immediately!

3.1.3 HEAT-STRESS MONITORING

For field activities part of ongoing site work activities in hot weather, the following procedures should be used to monitor the body's physiological response to heat and to estimate the work-cycle/rest-cycle when workers are performing moderate levels of work. These procedures should be considered when the ambient air temperature exceeds 70°F, the relative humidity is high(>50%), when workers are wearing semi-impermeable or impermeable clothing, or when the workers exhibit symptoms of heat stress.

The heart rate should be measured by the radial pulse for 30 seconds, as early as possible in the resting period. The HR at the beginning of the rest period should not exceed 110 beats/minute, or 20 beats/minute above resting pulse. If the HR is higher, the next work period should be shortened by 33 percent, while the length of the rest period stays the same. If the pulse rate still exceeds 110 beats/minute at the beginning of the next rest period, the following work cycle should be further shortened by 33 percent. The procedure is continued until the rate is maintained below 110 beats/minute, or 20 beats/minute above resting pulse. Additional methods of monitoring, such as taking oral temperature, or weighing individuals before and after their shift could also be included.

3.1.4 PREVENTING COLD STRESS

- Be aware of the symptoms of cold-related disorders, and *wear proper clothing for the anticipated fieldwork*.
- Consider monitoring the work conditions and adjusting the work schedule, using guidelines developed by the U.S. Army (wind-chill index) and the National Safety Council (NSC).
- *Wind-Chill Index.* This measure relates the dry bulb temperature and the wind velocity. It is used only to estimate the combined effect of wind and low air temperatures on exposed skin. The wind-chill index sometimes is limited in its usefulness because the index does not take into account the body part that is exposed, the level of activity, or the amount or type of clothing worn. For those reasons, it is used only as a guideline to warn workers when they are in a situation that can cause cold-related illnesses. Used in conjunction with the NSC guidelines, the wind-chill index provides a starting point for adjusting work and warm-up schedules.
- *NSC Guidelines for Work and Warm-Up Schedules.* The cold-exposure limits recommended by the NSC can be used in conjunction with the wind-chill index to estimate work and warm-up schedules for fieldwork. The guidelines are not absolute; *workers should be monitored for symptoms of cold-related illness*. If symptoms are not observed, the work duration can be increased.
- The wind-chill index and the NSC guidelines are in the XXXXX *Corporate Health and Safety Program, Program and Training Manual*, SOP HS-09.

[redacted]

3.1.5 SYMPTOMS AND TREATMENT OF COLD STRESS

	Immersion (Trench) Foot	Frostbite	Hypothermia
Signs and Symptoms	Feet discolored and painful; infection and swelling present.	Blanched, white, waxy skin, but tissue resilient; tissue cold and pale.	Shivering, apathy, sleepiness; rapid drop in body temperature; glassy stare; slow pulse; slow respiration.
Treatment	Seek medical treatment immediately.	Remove victim to a warm place. Rewarm area quickly in warm- but not hot-water. Have victim drink warm fluids, but not coffee or alcohol. Do not break blisters. Elevate the injured area, and get medical attention.	Remove victim to a warm place. Have victim drink warm fluids, but not coffee or alcohol. Get medical attention.

3.2 PROCEDURES FOR LOCATING BURIED UTILITIES

Local Utility Mark-Out Service
Name: Mr. Bruce Davis–Public Works Department
Phone: (4) 4973 (on-base phone) or (757) 444-4973 (off-base phone)

- Where available, obtain utility diagrams for the facility.
- Review locations of sanitary and storm sewers, electrical conduits, water supply lines, natural-gas lines, and fuel tanks and lines.
- Review proposed locations of intrusive work with facility personnel knowledgeable of locations of utilities. Check locations against information from utility mark-out service.
- Where necessary, clear locations with a utility-locating instrument (e.g., metal detector).
- Where necessary (e.g., uncertainty about utility locations), excavation or drilling of the upper depth interval should be performed manually.
- Monitor for signs of utilities during advancement of intrusive work (e.g., sudden change in advancement of auger or split spoon).
- When the client or other onsite party is responsible for determining the presence and locations of buried utilities, the SSC should confirm that arrangement.

Insert page 1 of Section 3.3–General Physical (Safety) Hazards and Controls

Footer for this table is HSOP/019b.DOC

Table 3-3 of the plan is provided as a separate file because it is an 11x17 document.

If you have difficulty with this document, please check with your local Document Processing Center for assistance.

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Insert page 2 of Section 3.3--General Physical (Safety) Hazards and Controls

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Insert page 3 of Section 3.3–General Physical (Safety) Hazards and Controls

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3.4 BIOLOGICAL HAZARDS AND CONTROLS

Hazard and Location	Control Measures
Snakes typically are found in underbrush and tall grassy areas.	If you encounter a snake, stay calm and look around; there may be other snakes. Turn around and walk away on the same path you used to approach the area. If a person is bitten by a snake, wash and immobilize the injured area, keeping it lower than the heart if possible. Seek medical attention immediately. DO NOT apply ice, cut the wound, or apply a tourniquet. Carry the victim or have him/her walk slowly if the victim must be moved. Try to identify the type of snake: note color, size, patterns, and markings.
Poison ivy, poison oak, and poison sumac typically are found in brush or wooded areas. They are more commonly found in moist areas or along the edges of wooded areas.	Become familiar with the identity of these plants. Wear protective clothing that covers exposed skin and clothes. Avoid contact with plants and the outside of protective clothing. If skin contacts a plant, wash the area with soap and water immediately. If the reaction is severe or worsens, seek medical attention.
Exposure to bloodborne pathogens may occur when rendering first aid or CPR, or when coming into contact with medical or other potentially infectious material, or when coming into contact with landfill waste or waste streams containing such infectious material.	Training is required before a task involving potential exposure is performed. Exposure controls and personal protective equipment (PPE) are required as specified in XXXXX SOP HS-36, *Bloodborne Pathogens*. Hepatitis B vaccination must be offered before the person participates in a task where exposure is a possibility.
Bees and other stinging insects may be encountered almost anywhere and may present a serious hazard, particularly to people who are allergic.	Watch for and avoid nests. Keep exposed skin to a minimum. Carry a kit if you have had allergic reactions in the past, and inform the SSC and/or the buddy. If a stinger is present, remove it carefully with tweezers. Wash and disinfect the wound, cover it, and apply ice. Watch for allergic reaction; seek medical attention if a reaction develops.

3.5 TICK BITES (Reference XXXXX HS-03, *Tick Bites*)

Ticks typically are in wooded areas, bushes, tall grass, and brush. Ticks are black, black and red, or brown and can be up to one-quarter inch in size.

Prevention against tick bites includes avoiding tick areas; wearing tightly woven light-colored clothing with long sleeves and wearing pant legs tucked into boots or socks; spraying only outside of clothing with insect repellent containing permethrin or permanone, and spraying skin with DEET; and checking yourself frequently for ticks and showering as soon as possible. To prevent chemical repellents from interfering with sample analyses, exercise care while using repellents during the collection and handling of environmental samples.

If bitten by a tick, carefully remove the tick with tweezers, grasping the tick as close as possible to the point of attachment while being careful not to crush the tick. After removing the tick, wash your hands and disinfect and press the bite area. The removed tick should be saved. Report the bite to human resources personnel.

Look for symptoms of Lyme disease or Rocky Mountain spotted fever (RMSF). Lyme: a rash that looks like a bullseye with a small welt in the center. RMSF: a rash of red spots under the skin 3 to 10 days after the tick bite. In both cases, chills, fever, headache, fatigue, stiff neck, bone pain may develop. If symptoms appear, seek medical attention.

3.6 RADIOLOGICAL HAZARDS AND CONTROLS

Refer to XXXXX's *Corporate Health and Safety Program, Program and Training Manual*, and *Corporate Health and Safety Program, Radiation Protection Program Manual*, for standards of practice for operating in contaminated areas.

Hazards	Controls
NONE ANTICIPATED	NONE REQUIRED

[redacted]

3.7 HAZARDS POSED BY CHEMICALS BROUGHT ON THE SITE

This section discusses hazards posed by chemicals commonly used during RI/FS and SSA field activities. Additional chemicals may be needed for future tasks.

REFER TO THE SITE-SPECIFIC ADDENDUM FOR INFORMATION ON HAZARDS POSED BY OTHER CHEMICALS BROUGHT ON SITE

3.7.1 HAZARD COMMUNICATION

(Reference XXXXX *Hazard Communication Manual* and Section 5 of the *Site Safety Notebook*)

XXXXX's *Hazard Communication Program Manual*, which is available from area or regional offices and from the Corporate Human Resources Department in Denver. The project manager is to request Material Safety Data Sheets (MSDSs) from the client or from the contractors and the subcontractors for chemicals to which XXXXX employees potentially are exposed. The SSC is to do the following:

- Give employees required site-specific HAZCOM training.
- Confirm that the inventory of chemicals brought on the site by subcontractors is available.
- Before or as the chemicals arrive on the site, obtain an MSDS for each hazardous chemical.
- Label chemical containers with the identity of the chemical and with hazard warnings, if any.

The chemical products listed below may be used on site. Refer to Attachment 2 for MSDSs.

Chemical	Quantity	Location
Methane (calibration gas)	1 liter, compressed gas	Support Zone
Isobutylene (calibration gas)	1 liter, compressed gas	Support Zone
Pentane (calibration gas)	1 liter, compressed gas	Support Zone
Hydrochloric Acid (sample preservative)	< 500 ml	Support/Exclusion Zone
Nitric Acid (sample preservative)	< 500 ml	Support/Exclusion Zone
Sulfuric Acid (sample preservative)	< 500 ml	Support/Exclusion Zone
Sodium Hydroxide (sample preservative)	< 500 ml	Support/Exclusion Zone
Methanol (decontamination solvent)	< 1 gallon	Support/Decontamination Zone
Hexane (decontamination solvent)	< 1 gallon	Support/Decontamination Zone
Isopropanol (decontamination solvent)	< 1 gallon	Support/Decontamination Zone
pH Buffers (calibration standard)	< 500 ml	Support Zone
MSA Sanitizer (respirator cleaner)	< 1 liter, powder	Support/Decontamination Zone
Alconox/Liquinox (detergent)	< 1 liter, powder/liquid	Support/Decontamination Zone

3.7.2 SHIPPING AND TRANSPORTATION OF CHEMICAL PRODUCTS

(Reference XXXXX's *Procedures for Shipping and Transporting Dangerous Goods*)

Nearly all chemicals brought to the site are considered hazardous materials by the U.S. Department of Transportation (DOT). All staff who ship the materials or transport them by road must receive the XXXXX training in shipping dangerous goods. All hazardous materials that are shipped (e.g., via Federal Express) or are transported by road must be properly identified, labeled, packed, and documented by trained staff. Contact the HSM or the Equipment Coordinator for additional information.

3.8 CONTAMINANTS OF CONCERN (REFER TO PROJECT FILES FOR MORE-DETAILED CONTAMINANT INFORMATION)

Contaminant	Location and Highest[1] Concentration (ppm)	Exposure Limit[2]	IDLH[3]	Symptoms and Effects of Exposure	PIP[4] (eV)
Arsenic	GW: SB: SS:	0.01 mg/m³	5 Ca	Ulceration of nasal septum, respiratory irritation; dermatitis; gastrointestinal disturbances; peripheral neuropathy, hyperpigmentation.	NA
Benzene	GW: SB: SS:	1 ppm	500 Ca	Eye, nose, skin, and respiratory irritation; headache; nausea; dermatitis; fatigue; giddiness; staggered gait; bone marrow depression	9.24
2-Butanone (Methyl Ethyl Ketone, MEK)	GW: SB: SS:	200 ppm	3,000	Eye, skin, and nose irritation: headache, dizziness; vomiting, dermatitis	9.54
Cadmium	GW: SB: SS:	0.005 mg/m³	9 Ca	Pulmonary edema, coughing, chest tightness/pain, headache; chills, muscle aches, nausea, vomiting, diarrhea; difficulty breathing; loss of sense of smell; emphysema; mild anemia	NA
Carbon Tetrachloride	GW: SB: SS:	2 ppm	200 Ca	Central nervous system (CNS) depression; nausea; vomiting; eye and skin irritation; liver and kidney injury; drowsiness; dizziness	11.47
Chlordane	GW: SB: SS:	0.5 mg/m³	100 Ca	Blurred vision, confusion, ataxia, delirium, coughing, abdominal pain, nausea, vomiting, diarrhea, irritability, tremors, anuria	UK
Chlorobenzene	GW: SB: SS:	10 ppm	1,000	Skin, eye, and nose irritation; drowsiness; uncoordination; CNS depression	9.07

[redacted]

3.8 CONTAMINANTS OF CONCERN (REFER TO PROJECT FILES FOR MORE-DETAILED CONTAMINANT INFORMATION)

Contaminant	Location and Highest[a] Concentration (ppm)	Exposure Limit[b]	IDLH[c]	Symptoms and Effects of Exposure	PIP[d] (eV)
Chloroform	GW: SB: SS:	2 ppm	500 Ca	Dizziness, mental dullness, nausea, confusion, disorientation, headache, fatigue, eye and skin irritation, anesthesia, enlarged liver	11.42
Chromium (as Cr(II) & Cr (III))	GW: SB: SS:	0.5 mg/m³	25	Irritated eyes, sensitization dermatitis, histologic fibrosis of lungs	NA
Chromium (hexavalent)	GW: SB: SS:	0.05 mg/m³	15 Ca	Irritated respiratory system; nasal septum perforation; liver and kidney damage; leucytosis; herpes; monocytosis; eosinophilia; eye injury, conjuctivitis; skin ulcer; sensitization dermatitis	NA
Cobalt (Metal, Dusts, and Fumes)	GW: SB: SS:	0.05 mg/m³	20	Coughing; difficulty breathing; wheezing; decreased pulmonary function; diffuse nodule fibrosois; dermatitis; respiratory hypersensitivity; asthma	NA
DDT	GW: SB: SS:	0.5 mg/m³	500 Ca	Paresthesia of tongue, lips, hand, and face; tremors; dizziness; confusion; headache; fatigue; convulsions; eye and skin irritation; vomiting	UK
o-Dichlorobenzene (1,2-Dichlorobenzene)	GW: SB: SS:	25 ppm	200 Ca	Nose and eye irritation; liver and kidney damage; skin blisters	9.06
p-Dichlorobenzene (1,4-Dichlorobenzene)	GW: SB: SS:	10 ppm	150 Ca	Headache; eye irritation, nausea, vomiting; swelling periorbital; profuse rhinitis; jaundice; cirrhosis	8.98
1,1-Dichloroethane	GW: SB: SS:	100 ppm	3,000	CNS depression, skin irritation; liver, kidney, and lung damage	11.06

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3.8 CONTAMINANTS OF CONCERN (REFER TO PROJECT FILES FOR MORE-DETAILED CONTAMINANT INFORMATION)					
Contaminant	**Location and Highest[a] Concentration (ppm)**	**Exposure Limit[b]**	**IDLH[c]**	**Symptoms and Effects of Exposure**	**PIP[d] (eV)**
1,2-Dichloroethane (Ethylene Dichloride)	GW: SB: SS:	1 ppm	50 Ca	CNS depression; nausea; vomiting; dermatitis; eye irritation; liver, kidney, and CNS damage; corneal opacity	11.05
Endosulfan	GW: SB: SS:	0.1 mg/m³	NL	Irritated skin, nausea, confusion, agitation, flushing, dry mouth, tremor, convulsion, headache	UK
Ethyl Benzene	GW: SB: SS:	100 ppm	800	Eye, skin, and mucous membrane irritation; headache; dermatitis; narcotic; coma	8.76
Lead	GW: SB: SS:	0.05 mg/m³	100	Weakness, lassitude; facial pallor; pal eye; weight loss, malnutrition; abdominal pain, constipation; anemia; gingival lead line; tremors; paralysis of wrist and ankles; encephalopathy; kidney disease; irritated eyes; hypotension	NA
Mercury	GW: SB: SS:	0.05 mg/m³	10	Skin and eye irritation, cough, chest pain, difficult breathing, bronchitis, pneumonitis, tremors, insomnia, irritability, indecision, headache, fatigue, weakness, GI disturbance	NA
Naphthalene	GW: SB: SS:	10 ppm	250	Eye irritation, headache, confusion, excitement, nausea, vomiting, abdominal pain, bladder irritation, profuse sweating, dermatitis, corneal damage, optical neuritis	8.12
PCBs	GW: SB: SS:	0.5 mg/m³	5 Ca	Eye and skin irritation, acne-form dermatitis, liver damage, reproductive effects	UK
PNAs (Limits as Coal Tar Pitch)	GW: SB: SS:	0.2 mg/m³	80 Ca	Dermatitis, bronchitis	UK

3.8 CONTAMINANTS OF CONCERN (REFER TO PROJECT FILES FOR MORE-DETAILED CONTAMINANT INFORMATION)					
Contaminant	Location and Highest[a] Concentration (ppm)	Exposure Limit[b]	IDLH[c]	Symptoms and Effects of Exposure	PIP[d] (eV)
1,1,2,2-Tetrachloroethane (Tetrachloroethane)	GW: SB: SS:	1 ppm	100 Ca	Nausea, vomiting, abdominal pain, finger tremors, jaundice, hepatitis, liver tenderness, monocytosis, kidney damage, dermatitis	11.10
Tetrachloroethene	GW: SB: SS:	25 ppm	150 Ca	Eye, nose, and throat irritation; nausea; flushed face and neck; vertigo; dizziness; sleepiness; skin redness; headache; liver damage	9.32
1,1,2-Trichloroethane	GW: SB: SS:	10 ppm	100 Ca	Eye and nose irritation, CNS depression, liver damage, dermatitis	11.00
Trichloroethylene	GW: SB: SS:	25 ppm	1,000 Ca	Headache, vertigo, visual disturbance, eye and skin irritation, fatigue, giddiness, tremors, sleepiness, nausea, vomiting, dermatitis, cardiac arrhythmia, paresthesia, liver injury	9.45
Toluene	GW: SB: SS:	50 ppm	500	Eye and nose irritation, fatigue, weakness, confusion, dizziness, headache, dilated pupils, excessive tearing, nervousness, muscle fatigue, paresthesia, dermatitis, liver and kidney damage	8.82
Xylenes	GW: SB: SS:	100 ppm	900	Irritated eyes, skin, nose, throat; dizziness; excitement; drowsiness; incoherence; staggering gait; corneal vacuolization; anorexia; nausea; vomiting; abdominal pain; dermatitis	8.56
Vinyl Chloride	GW: SB: SS:	1 ppm	NL Ca	Weakness, abdominal pain, gastrointestinal bleeding, enlarged liver, pallor or cyanosis of extremities	9.99
Vinylidene Chloride (1,1-dichloroethylene)	GW: SB: SS:	1 ppm	NL Ca	Eye, skin, and throat irritation; dizziness; headache; nausea; difficult breathing; liver and kidney dysfunction; pneumonitis	UK

3.8 CONTAMINANTS OF CONCERN (REFER TO PROJECT FILES FOR MORE-DETAILED CONTAMINANT INFORMATION)

Contaminant	Location and Highest[a] Concentration (ppm)	Exposure Limit[b]	IDLH[c]	Symptoms and Effects of Exposure	PIP[d] (eV)

Footnotes:

a: Specify sample-designation and media: SB (Soil Boring), A (Air), D (Drums), GW (Groundwater), L (Lagoon), TK (Tank), SS (Surface Soil), SL (Sludge), SW (Surface Water),

b: Appropriate value of PEL, REL, or TLV listed

c: IDLH = immediately dangerous to life and health (units are the same as specified "Exposure Limit" units for that contaminant); NL = No limit found in reference materials; CA = Potential occupational carcinogen

d: PIP = photoionization potential; NA = Not applicable; UK = Unknown

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3.9 POTENTIAL ROUTES OF EXPOSURE		
DERMAL: Contact with contaminated media. This route of exposure is minimized through proper use of PPE, as specified in Section 5.	**INHALATION:** Vapors and contaminated particulates. This route of exposure is minimized through proper respiratory protection and monitoring, as specified in sections 5 and 6, respectively.	**OTHER:** Inadvertent ingestion of contaminated media. This route should not present a concern if good hygiene practices are followed (e.g., wash hands and face before eating, drinking, or smoking).

[redacted]

4 PERSONNEL

REFER TO SITE-SPECIFIC ADDENDUM FOR ADDITIONAL FIELD PERSONNEL

4.1 XXXXX EMPLOYEE MEDICAL SURVEILLANCE AND TRAINING

(Reference XXXXX SOP HS-01, *Medical Surveillance*, and HS-02, *Health and Safety Training*)

The employees listed below are enrolled in the XXXXX Comprehensive Health and Safety Program and meet state and federal hazardous waste operations requirements for 40-hour initial training, 3-day on-the-job experience, and 8-hour annual refresher training. Employees designated "SSC" have received 8 hours of supervisor and instrument training and can serve as site safety coordinator (SSC) for the level of protection indicated. An SSC with a level designation (D, C, B) equal to or greater than the level of protection being used must be present during all tasks performed in exclusion or decontamination zones that involve the potential for exposure to health and safety hazards. Employees designated "FA-CPR" are currently certified by the American Red Cross, or equivalent, in first aid and CPR. At least one FA-CPR designated employee must be present during all tasks performed in exclusion or decontamination zones that involve the potential for exposure to health and safety hazards. The employees listed below are currently active in a medical surveillance program that meets state and federal regulatory requirements for hazardous waste operations. The XXXXX medical surveillance program is performed under the direct supervision of a licensed physician who is Board Certified in the practice of Occupational Medicine (see Section 13). Certain tasks (e.g., confined-space entry) and contaminants (e.g., lead) may require additional training and medical monitoring.

Pregnant employees are to be informed of and are to follow the procedures in XXXXX's SOP HS-04, *Reproduction Protection*, including obtaining a physician's statement of the employee's ability to perform hazardous activities, before being assigned fieldwork.

Employee Name	Office	Responsibility	SSC/FA-CPR
		Field Team Member	FA-CPR
		Field Team Leader/Member	Level (D) SSC; FA-CPR
		Field Team Leader/Member	Level (D) SSC; FA-CPR
		Field Team Leader/Member	Level (C) SSC; FA-CPR
		Field Team Leader/Member	FA-CPR
		Field Team Member	NA
		Field Team Leader/Member	Level (D); FA-CPR
		Field Team Leader/Member	Level (B) SSC; FA-CPR
		Field Team Member	FA-CPR
		Field Team Leader/Member	Level (B) SSC; FA-CPR

4.2.1 CLIENT

Client Contact Name:
Phone Number:
Facility Contact Names
and Phone Numbers:

[redacted]

4.2.2 XXXXX

REFER TO THE SITE-SPECIFIC HASP FOR THE FOLLOWING INFORMATION:

Project Manager/Phone:
Health and Safety Manager (PHSO)/Phone:
Field Team Leader/Phone:
Site Safety Coordinator/Phone:

The SSC is responsible for contacting the field team leader and the project manager. In general, the project manager either will contact or will identify the client contact. The Health and Safety Manager (HSM) should be contacted as appropriate. The SSC or the project manager must notify the client and the HSM when a serious injury or a death occurs or when health and safety inspections by OSHA or other agencies are conducted. Refer to sections 10 through 12 for emergency procedures and phone numbers.

4.2.3 SUBCONTRACTORS
(Reference Section 3, *Corporate Health and Safety Program Manual*)

When specified in the project documents (e.g., contract), this plan may cover XXXXX subcontractors. However, this plan does not address hazards associated with tasks and equipment that the subcontractor has expertise in (e.g., operation of drill rig). Specialty subcontractors are responsible for health and safety procedures and plans specific to their work. Specialty subcontractors are to submit plans to XXXXX for review and approval before the start of fieldwork. Subcontractors must comply with the established health and safety plan(s). XXXXX must monitor and enforce compliance with the established plan(s).

REFER TO THE SITE-SPECIFIC HASP FOR THE FOLLOWING INFORMATION:

Subcontractor:
Subcontractor Contact:
Telephone:

General health and safety communication with subcontractors contracted with XXXXX and covered by this plan is to be conducted as follows:

- Request that the subcontractor, if a specialty subcontractor, submit a safety or health plan applicable to their expertise (e.g., drill-rig safety plan or nuclear density gauge [NDG] health plan); attach the reviewed plan.
- Supply subcontractors with a copy of this plan, and brief them on its provisions.
- Direct health and safety communications to the subcontractor-designed safety representative
- Notify the subcontractor-designated representative if a violation of the plan(s) is observed. Specialty subcontractors are responsible for mitigating hazards in which they have expertise.
- If a hazard condition persists, inform the subcontractor. If the hazard is not mitigated, stop affected work as a last resort and notify the project manager.
- When an apparent imminent danger exists, promptly remove all affected personnel. Notify the project manager.
- Make clear that consistent violations of the health and safety plan by a subcontractor may result in termination of the subcontract.

4.2.4 CONTRACTORS

(Reference Section 3, *Corporate Health and Safety Program Manual*)

This plan does not cover contractors that are contracted directly to the client or the owner. XXXXX is not responsible for directing contractor personnel and is not to assume responsibility through their actions. When the contractor is in control of the site, ask the contractor to conduct a briefing of their health and safety practices and to describe how they apply to XXXXX's activities. Request a copy of the contractor's health and safety plan.

REFER TO THE SITE-SPECIFIC HASP FOR THE FOLLOWING INFORMATION:

Contractor:
Contact Name:
Telephone:

General health and safety communication with contractors *not* contracted with XXXXX is listed below. These procedures can also be applied to other third party communications (e.g., client personnel).

- Ask the contractor to brief XXXXX on the contractor's health and safety plan for how the plan affects XXXXX employees on the site.
- If acceptable to the client, communicate about health and safety directly with the contractor PM or other onsite contractor-designated representative. XXXXX employees are not to direct the details of the contractor's work or to advise on health and safety (e.g., how the contractor corrects unsafe conditions).
- If an observed hazard poses a risk to XXXXX personnel, notify the party controlling the work activity as soon as possible. Notify the project manager; the project manager will notify the client. Document oral notification in project records (i.e., the field logbook).
- If a hazardous condition endangering a XXXXX employee persists, inform the contractor and the project manager (the project manager will contact the client) that XXXXX cannot execute the assigned work until the hazard is mitigated.
- When an apparent imminent danger exists, orally warn the person(s) in danger and orally notify the contractor promptly. When an imminent danger involves a XXXXX employee, remove the employee and suspend XXXXX work immediately until the hazard has been mitigated. Inform the project manager and the contractor promptly.
- The SSC or the project manager must notify the client and XXXXX health and safety staff when (1) the contractor fails to remedy an unsafe condition affecting XXXXX personnel, (2) the contractor does not remedy the hazardous condition within a reasonable period of time, or (3) the contractor repeatedly creates the hazardous condition.

[redacted]

5 PERSONAL PROTECTIVE EQUIPMENT (PPE) (Reference XXXXX SOP HS-07, *Personal Protective Equipment*, HS-08, *Respiratory Protection*, Section 2 of the *Site Safety Notebook*)

REFER TO THE SITE-SPECIFIC HASP FOR THE REQUIRED LEVEL OF PERSONAL PROTECTION TO USE DURING FILED ACTIVITIES

5.1 PPE SPECIFICATIONS[a]

Task	Level	Body	Head	Respirator[b]
General work uniform when no chemical exposure is anticipated	D	Work clothes; steel-toe, steel-shank leather work boots; work gloves	Hardhat[c] Safety glasses Ear protection[d]	None required
Low exposure tasks such as: Monitoring well installation and all sampling activities.	Modified D	COVERALLS: Uncoated Tyvek® BOOTS: Steel-toe, steel-shank chemical-resistant boots OR steel-toe, steel-shank leather work boots with outer rubber boot covers GLOVES: Inner surgical-style nitrile glove AND outer chemical-resistant nitrile glove.	Hardhat[c] Splash shield[c] Safety glasses Ear protection[d]	None required
Tasks requiring upgrade per sections 5.2 or 6.	C	COVERALLS: Polycoated Tyvek® BOOTS: Steel-toe, steel-shank chemical-resistant boots OR steel-toe, steel-shank leather work boots with outer rubber boot covers GLOVES: Inner surgical-style nitrile glove AND outer chemical-resistant nitrile glove.	Hardhat[c] Splash shield[c] Ear protection[d] Spectacle inserts	APR, full face, MSA Ultratwin or equivalent; with GME-H[e] cartridges or equivalent
None anticipated	B	COVERALLS: Polycoated Tyvek® BOOTS: Steel toe, steel-shank chemical-resistant boots OR steel-toe, steel-shank leather work boots with outer rubber boot covers GLOVES: Inner surgical-style nitrile glove AND outer chemical-resistant nitrile glove.	Hardhat[c] Splash shield[c] Ear protection[d] Spectacle inserts	Positive-pressure demand self-contained breathing apparatus (SCBA): MSA Ultralite, or equivalent

[a] Modifications are as indicated. XXXXX will provide PPE to only XXXXX employees.
[b] No facial hair that would interfere with respirator fit is permitted.
[c] Hardhat and splash-shield areas are to determined by the SSC.
[d] Ear protection should be worn while working around drill rigs or other noise-producing equipment or when conversations cannot be held at distances of 3 feet or less without shouting. Refer to Section 6 for other requirements.
[e] The GME-H cartridge is the new standard-issue cartridge. Available stock of the previously standard GMC-H cartridges may be used for tasks covered by this plan.

5.2 REASONS FOR UPGRADING OR DOWNGRADING LEVEL OF PROTECTION

Upgrade*	Downgrade
• Request from individual performing task. • Change in work task that will increase contact or potential contact with hazardous materials. • Occurrence or likely occurrence of gas or vapor emission. • Known or suspected presence of dermal hazards. • Instrument action levels (Section 6) exceeded.	• New information indicating that situation is less hazardous than originally thought. • Change in site conditions that decreases the hazard. • Change in work task that will reduce contact with hazardous materials.

*Performing a task that requires an upgrade to a higher level of protection (e.g., level D to level C) is permitted only when the PPE requirements have been specified in Section 5 and an SSC who meets the requirements specified in subsection 4.1 is present.

[redacted]

6 AIR MONITORING SPECIFICATIONS (Reference XXXXX SOP HS-06, *Air Monitoring*, and Section 2 of the *Site Safety Notebook*)

REFER TO THE SITE-SPECIFIC HASP FOR THE REQUIRED MONITORING INSTRUMENTS

TO USE DURING FIELD ACTIVITIES

Instrument	Tasks	Action Levels[a]		Frequency[b]	Calibration
PID: OVM with 10.6eV lamp or equivalent	Monitoring well installation, soil, and groundwater sampling activities.	0 - 5 ppm 5 - 10 ppm >10 ppm	Level D Level C Level B (not anticipated)	Initially and periodically during task	Daily; before and after each period of use
CGI: MSA model 260 or 261 or equivalent	Drilling Excavation	0-10%< LEL: 10-25%< LEL: >25%< LEL:	No explosion hazard Potential explosion hazard Explosion hazard; evacuate or vent	Continuous during advancement of boring or trench	Daily; before and after each period of use
O_2 Meter: MSA model 260 or 261 or equivalent	Drilling Excavation	>25.0%< O_2: 20.9%< O_2: <19.5%< O_2:	Explosion hazard; evacuate or vent Normal O_2 O_2 deficient; vent or use SCBA	Continuous during advancement of boring or trench	Daily; before and after each period of use
Dust Monitor: Visual	All tasks	No visible dust Visible dust	Level D Level C Stop work; implement dust suppression measures	Initially and periodically during task	Zero twice daily; once before use and once at midday

Note a: Action levels apply to sustained breathing-zone measurements above background.

Note b: The exact frequency of monitoring depends on field conditions and is to be determined by the SSC; generally, every 5 to 15 minutes is acceptable; more frequently may be appropriate. Monitoring results should be recorded. Documentation should include instrument and calibration information, time and measurement result, personnel monitored, and place/location where measurement is taken (e.g., "Breathing Zone/ MW-3," "at surface/SB-2," etc.).

Note c: If the measured percent of O_2 is less than 10, an accurate LEL reading will not be obtained. Percent LEL and percent O_2 action levels apply to only ambient working atmospheres, and do not apply to confined-space entry. More-stringent percent LEL and O_2 action levels are required for confined-space entry; refer to Section 9.

6.1 CALIBRATION SPECIFICATIONS
(Refer to the respective manufacturer's instructions for proper instrument-maintenance procedures)

Instrument	Gas	Span	Reading	Method
PID: OVM, 10.0 or 10.6 eV bulb	100 ppm isobutylene	RF = 0.55	55 ppm	1.5 lpm reg T-tubing
OVM, 11.8 eV bulb		RF = 0.68	68 ppm	
PID: MiniRAE, 10.6 eV bulb	100 ppm isobutylene	CF=53	53 ppm ±5 ppm	1.5 lpm REG T-Tubing
PID: TVA 1000	100 ppm isobutylene	CF=0.55	55 ppm ± 5 ppm	1.5 lpm REG T-Tubing
FID: TVA 1000	100 ppm methane	CF=1.00	100 ppm ± 10	1.5 lpm reg T-tubing
Dust Monitor: Miniram-PDM3	Dust-free air	Not applicable	0.00 mg/m³ in "Measure" mode	Dust-free area OR Z-bag with HEPA filter
CGI: MSA 260, 261, 360, or 361	0.75% pentane	N/A	50% LEL ±5 % LEL	1.5 lpm reg direct tubing

6.2 AIR SAMPLING
Sampling may be required by other OSHA regulations where there may be exposure to certain contaminants. Air sampling typically is required when site contaminants include lead, cadmium, arsenic, asbestos, and certain volatile organic compounds. Contact the HSM immediately if these contaminants are encountered.

Method Description: REFER TO SITE-SPECIFIC HASP IF APPLICABLE

Personnel and Areas
Results must be sent immediately to the HSM. Regulations may require reporting to monitored personnel. Results reported to:

HSM:
Other:

[redacted]

7 DECONTAMINATION (REFERENCE XXXXX SOP HS-13, *DECONTAMINATION*)

REFER TO THE SITE-SPECIFIC HASP FOR DETAILS OF DECONTAMINATION

REFER TO THE MASTER INVESTIGATION-DERIVED WASTE MANAGEMENT PLAN FOR METHODS OF DISPOSAL

The SSC must monitor the effectiveness of the decontamination procedures. Decontamination procedures found to be ineffective will be modified by the SSC.

7.1 DECONTAMINATION SPECIFICATIONS

Personnel	Sample Equipment	Heavy Equipment
• Boot wash/rinse	• Wash/rinse equipment	• Power wash
• Glove wash/rinse	• Solvent-rinse equipment	• Steam clean
• Outer-glove removal	• **Solvent-disposal method:**	• **Water-disposal method:**
• Body-suit removal		
• Inner-glove removal		
• Respirator removal		
• Hand wash/rinse		
• Face wash/rinse		
• Shower ASAP		
• **PPE-disposal method:**		
• **Water-disposal method:**		

7.2 DIAGRAM OF PERSONNEL-DECONTAMINATION LINE

No eating, drinking, or smoking is permitted in contaminated areas and in exclusion or decontamination zones. The SSC should establish areas for eating, drinking, and smoking. Contact lenses are not permitted in exclusion or decontamination zones.

Figure 7-1 illustrates a typical establishment of work zones, including the decontamination line. Work zones are to be modified by the SSC to accommodate task-specific requirements.

8 SPILL-CONTAINMENT PROCEDURES

Sorbent material will be maintained in the support zone. Incidental spills will be contained with sorbent and will be disposed of properly.

9 CONFINED-SPACE ENTRY

(Reference XXXXX SOP HS-17, *Confined Space Entry*)

No confined-space entry will be permitted. Confined-space entry requires additional health and safety procedures, training, and a permit. If conditions change such that confined-space entry is necessary, contact the HSM to develop the required entry permit.

When planned activities will not include confined-space entry, permit-required confined spaces accessible to XXXXX personnel are to be identified before the task begins. The SSC is to confirm that permit spaces are properly posted or that employees are informed of their locations and informed of their hazards.

Figure goes here

[redacted]

10.1 SITE CONTROL PROCEDURES

- The site safety coordinator (SSC) will conduct a site safety briefing (see below) before starting field activities or as tasks and site conditions change.
- Topics for briefing on site safety: general discussion of health and safety plan, site-specific hazards, locations of work zones, PPE requirements, equipment, special procedures, emergencies. Refer to Section 8 of *Site Safety Notebook*.
- The SSC records attendance at safety briefings in a logbook and documents the topics discussed.
- The SSC will ensure that a daily log-in and log-out book is maintained for all personnel entering the site.
- Post the OSHA job-site poster in a central and conspicuous location at sites where project field offices, trailers, or equipment storage boxes are established. Posters can be obtained by calling either 800/548-4776 or 800/999-9111.
- Field Trailers: Post "Exit" signs above exit doors, and post "Fire Extinguisher" signs above locations of extinguishers. Keep areas near exits and extinguishers clear.
- Determine wind direction.
- Establish work zones: support, decontamination, and exclusion zones. Delineate work zones with flags or cones as appropriate. Support zone should be upwind of the site.
- Establish decontamination procedures, including respirator-decontamination procedures, and test the procedures.
- Use access control at the entry and exit from each work zone.
- Store chemicals in appropriate containers.
- Make MSDSs available for onsite chemicals to which employees are exposed.
- Establish onsite communication consisting of the following:
  - Line-of-sight and hand signals
  - Air horn
  - Two-way radio or cellular telephone if available
- Establish offsite communication.
- Establish and maintain the "buddy system."
- Establish procedures for disposing of material generated on the site.
- Initial air monitoring is conducted by the SSC in appropriate level of protection.
- The SSC is to conduct periodic inspections of work practices to determine the effectiveness of this plan – refer to XXXXX SOP 18, *Health and Safety* Checklist, or Section 4 of *Site Safety Notebook*. Deficiencies are to be noted, reported to the HSM, and corrected.

10.2 HAZWOPER COMPLIANCE PLAN (Reference XXXXX SOP HS-17, *Health and Safety Plans*)

This section outlines procedures to be followed when certain activities do not require 24- or 40-hour training. ***Note, prior approval from the HSM is required before these tasks are conducted on regulated hazardous waste sites.***

- Certain parts of the site work may be covered by state or federal Hazwoper standards and therefore require training and medical monitoring. Anticipated tasks must be included in subsection 2.2.1.
- Air sampling must confirm that there is no exposure to gases or vapors before non-Hazwoper-trained personnel are allowed on the site. Other data (e.g., soil) also must document that there is no potential for exposure. The HSM must approve the interpretation of these data. Refer to subsections 3.8 and 6.2 for contaminant data and air sampling requirements, respectively.
- Non-Hazwoper-trained personnel must be informed of the nature of the existing contamination and its locations, the limits of their access, and the emergency action plan for the site. Non-Hazwoper-trained personnel also must be trained in accordance with all other state and federal OSHA requirements, including 29 CFR 1910.1200 (HAZCOM). Refer to subsection 3.7.1 for hazard communication requirements.
- Air monitoring with direct-reading instruments conducted during regulated tasks also should be used to ensure that non-Hazwoper-trained personnel (e.g., in an adjacent area) are not exposed to volatile contaminants. Non-Hazwoper-trained personnel should be monitored whenever the belief is that there may be a possibility of exposure (e.g., change in site conditions), or at some reasonable frequency to confirm that there is no exposure. Refer to Section 6.1 for air monitoring requirements.
- Treatment system start-ups: Once a treatment system begins to pump and treat contaminated media, the site is, for the purposes of applying the Hazwoper standard, considered a treatment, storage, and disposal facility (TSDF). Therefore, once the system begins operation, only Hazwoper-trained personnel (minimum of 24 hours of training) will be permitted to enter the site. All non-Hazwoper-trained personnel must leave the site.

If Hazwoper-regulated tasks are conducted concurrently with nonregulated tasks, non-Hazwoper-trained subcontractors must be removed from areas of exposure. If non-Hazwoper-trained personnel remain on the site while a Hazwoper-regulated task is conducted, the contaminant/exposure area (exclusion zone) must be posted, non-Hazwoper-trained personnel must be reminded of the locations of restricted areas and the limits of their access, and real-time monitoring must be conducted. Non-Hazwoper-trained personnel at risk of exposure must be removed from the site until it can be demonstrated that there is no longer a potential for exposure to health and safety hazards.

11 EMERGENCY RESPONSE PLAN (REFERENCE XXXX SOP HS-12, *EMERGENCY RESPONSE*)

11.1 PRE-EMERGENCY PLANNING

The SSC performs the applicable pre-emergency planning tasks before starting field activities and coordinates emergency response with the facility and local emergency-service providers as appropriate.

- Review the facility emergency and contingency plans where applicable.
- Locate the nearest telephone; determine what onsite communication equipment is available (e.g., two-way radio, air horn).
- Identify and communicate chemical, safety, radiological, and biological hazards.
- Confirm and post emergency telephone numbers, evacuation routes, assembly areas, and route to hospital; communicate the information to onsite personnel.
- Post site map marked with locations of emergency equipment and supplies, and post OSHA job-site poster. The OSHA job-site poster is required at sites where project field offices, trailers, or equipment-storage boxes are established. Posters can be obtained by calling either 800/548-4776 or 800/999-9111.
- Field Trailers: Post "Exit" signs above exit doors, and post "Fire Extinguisher" signs above locations of extinguishers. Keep areas near exits and extinguishers clear.
- Review changed site conditions, onsite operations, and personnel availability in relation to emergency response procedures.
- Evaluate capabilities of local response teams where applicable.
- Where appropriate and acceptable to the client, inform emergency room and ambulance and emergency response teams of anticipated types of site emergencies.
- Designate one vehicle as the emergency vehicle; place hospital directions and map inside; keep keys in ignition during field activities.
- Inventory and check site emergency equipment, supplies, and potable water.
- Communicate emergency procedures for personnel injury, exposures, fires, explosions, chemical and vapor releases.
- Review notification procedures for contacting XXXXX's medical consultant and team member's occupational physician.
- Rehearse the emergency response plan once before site activities begin, including driving the route to the hospital.
- The emergency response plan will be periodically exercised and critiqued.
- Brief new workers on the emergency response plan.
- The SSC will evaluate emergency response actions and initiate appropriate follow-up actions.

11.2 EMERGENCY EQUIPMENT AND SUPPLIES

REFER TO SITE-SPECIFIC HASP FOR A LIST OF ADDITIONAL EMERGENCY EQUIPMENT

The SSC should mark the locations of emergency equipment on the site map and should post the map.

Emergency Equipment and Supplies	Location
20 lb. (or two 10-lb.) fire extinguisher (A, B, and C classes)	XXXXX Field Vehicle
First aid kit	XXXXX Field Vehicle
Eye wash*	XXXXX Field Vehicle
Potable water	XXXXX Field Vehicle
Bloodborne-pathogen kit	XXXXX Field Vehicle

*The emergency eye wash unit must meet the American National Standards Institute (ANSI) criteria and be capable of delivering 1.5 liters (0.4 gallons) per minute of potable water to the eyes for fifteen minutes.

11.3 EMERGENCY MEDICAL TREATMENT

- Notify appropriate emergency response authorities listed in sections 12 and 13 (e.g., 911).
- During a time of no emergency, contact XXXXX's medical consultant for advice and guidance on medical treatment.
- The SSC will assume charge during a medical emergency until the ambulance arrives or until the injured person is admitted to the emergency room.
- Prevent further injury.
- Initiate first aid and CPR where feasible.
- Get medical attention immediately.
- Perform decontamination where feasible, and to the extent possible; lifesaving and first aid or medical treatment take priority. Decontamination procedures may need to be postponed, but should be implemented as soon as possible after the victim is stabilized.
- Notify the field team leader and the project manager of the injury.
- Make certain that the injured person is accompanied to the emergency room.
- Notify the health and safety manager.
- Notify the injured person's human resources department within 24 hours.
- Prepare an incident report – refer to XXXXX SOP 12, *Emergency Response and First Aid*, and Section 6 of *Site Safety Notebook*. Submit the report to the corporate director of health and safety and the corporate human resources department (COR) within 48 hours.
- When contacting the medical consultant, state that you are calling about a XXXXX matter, and give your name, your telephone number, the name of the injured person, the extent of the injury or exposure, and the name and location of the medical facility where the injured person was taken.

11.4 NON-EMERGENCY PROCEDURES

The procedures listed above may be applied to non-emergency incidents. Injuries and illnesses (including overexposure to contaminants) must be reported to Human Resources. If there is doubt about whether medical treatment is necessary, or if the injured person is reluctant to accept medical treatment, contact the XXXXX medical consultant.

- When contacting the medical consultant, state that the situation is a XXXXX matter, and give your name, your telephone number, the name of the injured person, the extent of the injury or exposure, and the name and location of the medical facility where the injured person was taken.
- Follow these procedures as appropriate.

11.5 INCIDENT RESPONSE

In fires, explosions, or chemical releases, actions to be taken include the following:

- Shut down XXXXX operations and evacuate the immediate work area.
- Account for personnel at the designated assembly area(s).
- Notify appropriate response personnel.
- Assess the need for site evacuation, and evacuate the site as warranted.

Instead of implementing a work-area evacuation, note that small fires or spills posing minimal safety or health hazards may be controlled.

11.6 EVACUATION

- Evacuation routes will be designated by the SSC before work begins.
- Onsite and offsite assembly points will be designated before work begins.
- Personnel will leave the exclusion zone and assemble at the onsite assembly point upon hearing the emergency signal for evacuation.
- Personnel will assemble at the offsite point upon hearing the emergency signal for a site evacuation.
- The SSC and a "buddy" will remain on the site after the site has been evacuated (if possible) to assist local responders and advise them of the nature and location of the incident.
- The SSC accounts for all personnel in the onsite assembly zone.
- A person designated by the SSC before work begins will account for personnel at the offsite assembly area.
- The SSC will write up the incident as soon as possible after it occurs and will submit a report to the corporate director of health and safety.

11.7 EVACUATION ROUTES AND ASSEMBLY POINTS

Refer to the site map in Section 1. Evacuation routes and assembly areas (and alternative routes and assembly areas) are specified on the site map.

11.8 EVACUATION SIGNALS

Signal	Meaning
Grasping throat with hand	Emergency–help me.
Thumbs up	OK; understood.
Grasping buddy's wrist	Leave area now.

Continuous sounding of horn	Emergency; leave site now.

[redacted]

12 EMERGENCY RESPONSE

12.1 EMERGENCY RESPONSE TELEPHONE NUMBERS

REFER TO SITE-SPECIFIC HASP FOR ADDITIONAL PHONE NUMBERS

SITE ADDRESS: Naval Base, Norfolk Norfolk, Virginia	Phone: Section 4. Cellular Phone: See Addendum
Security (NAVBASE): Response Operator	Phone: (4) 2324 or (757) 444-2324 (4) 2737 or (757) 444-2737
Fire: Security (HAS):	Phone:
Ambulance: (Sewell Point) (Public)	Phone: (4) 2674 or (757) 444-2674 (9) 911 or 911
Public Works Department (Utility Clearances):	Phone:
Emergency: (one call)	Phone: (4) 0716 or 0720, or 911
Hazardous Waste Dispatcher:	Phone:
COMNAVBASE Duty Desk**	Phone: (757) 322-2866/67
Local Emergency Planning Committee (LEPC)	Phone: (757) 441-2171

*When using a cellular phone outside the telephone's normal calling area, exercise caution in relying on the cellular phone to activate 911. When the caller is outside the normal calling area, the cellular service carrier should connect the caller with emergency services in the area where the call originated, but this may not occur. Telephone numbers of backup emergency services should be provided if a cellular phone is relied on to activate 911.

** All spills must be reported to the COMNAVBASE Duty Desk

Hospital: DePaul Medical Center Address: 150 Kingsley Lane, Norfolk, VA	Phone: (9) 889-5111 or (757) 889-5111 (emergency room)

Route to Hospital: (Refer to Figure 12-1) - Depends on location within base area

12.2 GOVERNMENT AGENCIES INVOLVED IN PROJECT

Federal Agency and Contact Name: Phone:	Department of the Navy, Atlantic Division
State Agency and Contact Name: Phone:	Not assigned
Local Agency and contact Name: Phone:	Not assigned

Contact the project manager. Generally, the project manager will contact relevant government agencies.

THIS PAGE IS RESERVED FOR MAP OF ROUTE TO HOSPITAL

FIGURE 12-1

[redacted]

13 EMERGENCY CONTACTS

REFER TO SITE-SPECIFIC HASP FOR ADDITIONAL NAMES AND PHONE NUMBERS

If an injury occurs, notify the injured person's personnel office as soon as possible after obtaining medical attention for the injured person. Notification MUST be made within 24 hours of the injury.

XXXXX Medical Consultant	Occupational Physician (Regional or Local)
Corporate Director Health and Safety	Site Safety Coordinator (SSC) Name: Phone:
Medical and Training Administrator Name: Phone:	Regional Manager Name: Phone
Health and Safety Manager (HSM) Name: Phone:	Project Manager Name: Refer to site-specific addendum Phone:
Radiation Health Manager (RHM) Name: Phone:	Regional Human Resources Department Name: Phone
Client Name: Phone:	Corporate Human Resources Department Name: Phone:
Federal Express Dangerous Goods Shipping Phone: 800/238-5355 XXXXX Emergency Number for Shipping Dangerous Goods Phone: 800/255-3924	Worker's Compensation and Auto Claims Phone: After hours Report fatalities AND report vehicular accidents involving pedestrians, motorcycles, or more than two cars.

14 APPROVAL

This site-specific health and safety plan has been written for use by XXXXX only. XXXXX claims no responsibility for its use by others unless that use has been specified and defined in project or contract documents. The plan is written for the specific site conditions, purposes, dates, and personnel specified and must be amended if those conditions change.

14.1 ORIGINAL PLAN

WRITTEN BY: **DATE:**

APPROVED BY: **DATE:**

14.2 REVISIONS

REVISIONS MADE BY: **DATE:**

REVISIONS TO PLAN:

REVISIONS APPROVED BY: **DATE:**

15 DISTRIBUTION

REFER TO SITE-SPECIFIC HASP FOR ADDITIONAL NAMES

Name	Office	Responsibility	Number of Copies
		Senior Program Assistant	1
		Health and Safety Manager/Approver	1
		Project Manager	
		Field Team Leader/Member	
		Site Safety Coordinator	
		Client Project Manager	

16 ATTACHMENTS

Attachment 1: Employee Signoff
Attachment 2: Applicable Material Safety Data Sheets

[redacted]

Attachment 1
Employee Signoff

EMPLOYEE SIGNOFF

The employees listed below have been given a copy of this health and safety plan, have read and understood it, and agree to abide by its provisions.

EMPLOYEE NAME	EMPLOYEE SIGNATURE AND DATE

Attachment 2
Material Safety Data Sheets

Note: MSDSs are included in the Master Work Plan.